

SUBSTITUTE SEQUENCE LISTING

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VICHIER-GUERRE, SOPHIE
FERRIS, STEPHANE

<120> METHODS FOR OBTAINING THERMOSTABLE ENZYMES, DNA POLYMERASE I
VARIANTS FROM THERMUS AQUATICUS HAVING NEW CATALYTIC ACTIVITIES,
METHODS FOR OBTAINING THE SAME, AND APPLICATIONS OF THE SAME

<130> 295295US-10590810

<140> 10/590,810

<141> 2006-08-25

<150> PCT/IB05/00734

<151> 2005-02-25

<150> 10/787,219

<151> 2004-02-27

<160> 108

<170> PatentIn version 3.3

<210> 1

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 1

taacaatagg ccggccaccc cttc

24

<210> 2

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 2

gagtttttgt tctgcggc

18

<210> 3

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 3

tttaatcatc tgcagtaccg ggagctc

27

<210> 4
 <211> 28
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <400> 4
 ttcattcttg ctagctcctg ggagaggc

28

<210> 5
 <211> 43
 <212> DNA
 <213> Artificial Sequence

 <220>
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 <220>
 <221> modified_base
 <222> (15)..(17)
 <223> This region may encompass the bases "car" or "avy"

 <220>
 <221> modified_base
 <222> (24)..(26)
 <223> This region may encompass the bases "car" or "avy"

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 ccggccaccc cttnnnctc aacnnncggg accagctgga aag

43

<210> 6
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 <212> DNA
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 <220>
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 <222> (17)..(19)
 <223> This region may encompass the bases "ytg" or "rbt"

 <220>
 <221> modified_base
 <222> (20)..(22)
 <223> This region may encompass the bases "ytg" or "rbt"

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 <221> modified_base
 <222> (26)..(28)
 <223> This region may encompass the bases "ytg" or "rbt"

 <220>
 <221> modified_base
 <222> (44)..(46)
 <223> This region may encompass the bases "ytg" or "rbt"

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gcagg 65

<210> 7
<211> 62
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<220>
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<223> This region may encompass the bases "car" or "avy"

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<223> This region may encompass the bases "car" or "avy"

<220>
<221> modified_base
<222> (41)..(43)
<223> This region may encompass the bases "car" or "avy"

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cc 62

<210> 8
<211> 43
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<213> Artificial Sequence

<220>
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<222> (14)..(16)
<223> This region may encompass the bases "ytg" or "rbt"

<220>
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<222> (23)..(25)
<223> This region may encompass the bases "ytg" or "rbt"

<400> 8
cgcctcccg cacnnncttc acnnnggcct ctaggctctgg cac 43

<210> 9
<211> 65
<212> DNA

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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<220>
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<222> (20)..(22)
<223> This region may encompass the bases "car" or "avy"

<220>
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<222> (38)..(40)
<223> This region may encompass the bases "car" or "avy"

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<222> (44)..(46)
<223> This region may encompass the bases "car" or "avy"

<220>
<221> modified_base
<222> (47)..(49)
<223> This region may encompass the bases "car" or "avy"

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catcc                                                                    65

<210> 10
<211> 62
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<220>
<221> modified_base
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<223> This region may encompass the bases "ytg" or "rbt"

<220>
<221> modified_base
<222> (29)..(31)
<223> This region may encompass the bases "ytg" or "rbt"

<220>
<221> modified_base
<222> (44)..(46)
<223> This region may encompass the bases "ytg" or "rbt"

<400> 10
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tg                                                                    62

<210> 11

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<211> 43
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <220>
 <221> modified_base
 <222> (19)..(21)
 <223> This region may encompass the bases "car" or "avy"

 <220>
 <221> modified_base
 <222> (28)..(30)
 <223> n is a, c, g, or t

 <220>
 <221> modified_base
 <222> (28)..(30)
 <223> This region may encompass the bases "car" or "avy"

 <400> 11
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 <210> 12
 <211> 30
 <212> RNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <400> 12
 aaauacaaca auaaaacgcc acaucuugcg 30

 <210> 13
 <211> 28
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <400> 13
 taacacgaca aagcgcaaga tgtggcgt 28

 <210> 14
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <400> 14
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<210> 15
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 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <400> 15
 ttcattcttg ctagctcctg ggagaggc 28

 <210> 16
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
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 <400> 16
 gagaagatcc tgcagtaccg ggagc 25

 <210> 17
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <400> 17
 gaccaacatc aagactgcc 19

 <210> 18
 <211> 18
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

 <400> 18
 ttggccagga acttgtcc 18

 <210> 19
 <211> 1688
 <212> DNA
 <213> Thermus aquaticus

 <220>
 <221> CDS
 <222> (3)..(1688)

 <400> 19
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 Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys

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gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly 20 25 30				95
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu 35 40 45				143
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys 50 55 60				191
gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu 65 70 75				239
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp 80 85 90 95				287
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu 100 105 110				335
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu 115 120 125				383
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu 130 135 140				431
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro 145 150 155				479
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp 160 165 170 175				527
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala 180 185 190				575
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu 195 200 205				623
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu 210 215 220				671
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala 225 230 235				719
gcc gtc ctg gag gcc ctt cgc gag gcc cac ccc atc gtg gag aag atc Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240 245 250 255				767

ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att ggc ccc Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Gly Pro 260 265 270	815
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe 275 280 285	863
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290 295 300	911
ctc cag aac gtc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg Leu Gln Asn Val Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315	959
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc cgg gtc ttc cag gag ggg cgg gat atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
aag acc ctg gag gag ggt agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445	1343
ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc acg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Thr Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu 480 485 490 495	1487

gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc	1535
Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val	
500 505 510	

ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag	1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys	
515 520 525	

gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag	1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu	
530 535 540	

gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg	1679
Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu	
545 550 555	

gtg ccg cgc	1688
Val Pro Arg	
560	

<210> 20
 <211> 562
 <212> PRT
 <213> Thermus aquaticus

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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe	
20 25 30	

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala	
35 40 45	

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala	
50 55 60	

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser	
65 70 75 80	

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro	
85 90 95	

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly	
100 105 110	

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg	
115 120 125	

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu	
130 135 140	

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
 225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Gly Pro Leu
 260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
 290 295 300

Gln Asn Val Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
 370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430

Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
 450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480

Ala Asp Leu Thr Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
 485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
 500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
 515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
 530 535 540

Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 21
 <211> 1688
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (3)..(1688)

<400> 21
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 Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys

47

1	5	10	15	
gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc				95
Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly	20	25	30	
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg				143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	35	40	45	
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa				191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	50	55	60	
gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg				239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	65	70	75	
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac				287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	80	85	90	95
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag				335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	100	105	110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag				383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	115	120	125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt				431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	130	135	140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc				479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	145	150	155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac				527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	160	165	170	175
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc				575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	180	185	190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc				623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	195	200	205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt				671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	210	215	220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc				719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	225	230	235	
gcc gtc ctg ggg gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc				767
Ala Val Leu Gly Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile	240	245	250	255

ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro 260 265 270	815
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe 275 280 285	863
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290 295 300	911
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315	959
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cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
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ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu 480 485 490 495	1487

gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc 1535
 Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val
 500 505 510

ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag 1583
 Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys
 515 520 525

gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag 1631
 Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu
 530 535 540

gtg ggg ata ggg gag gac agg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

<210> 22
 <211> 562
 <212> PRT
 <213> Thermus aquaticus

<400> 22
 Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys Ala
 1 5 10 15

Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
 115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
 225 230 235 240

Val Leu Gly Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
 260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
 290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Thr Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
 370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430

Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
 450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
 485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
 500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
 515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
 530 535 540

Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 23
 <211> 1688
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (3)..(1688)

<400> 23
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 Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys

47

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gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly 20 25 30				95
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu 35 40 45				143
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys 50 55 60				191
gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu 65 70 75				239
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp 80 85 90 95				287
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu 100 105 110				335
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu 115 120 125				383
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu 130 135 140				431
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro 145 150 155				479
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp 160 165 170 175				527
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala 180 185 190				575
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc caa ctc Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Gln Leu 195 200 205				623
aac caa cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt Asn Gln Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu 210 215 220				671
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala 225 230 235				719
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240 245 250 255				767

ctg cag tac cgg gag ctc aac aag ctg aag agc acc caa att act cag Leu Gln Tyr Arg Glu Leu Asn Lys Leu Lys Ser Thr Gln Ile Thr Gln 260 265 270	815
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe 275 280 285	863
aac cag acg gcc acg caa acg ggc agg cta agt agc tcc cag ccc aac Asn Gln Thr Ala Thr Gln Thr Gly Arg Leu Ser Ser Ser Gln Pro Asn 290 295 300	911
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315	959
acc ttc atc gcc gag gag ggg agg cta ttg gtg gcc ctg gac tat aac Thr Phe Ile Ala Glu Glu Gly Arg Leu Leu Val Ala Leu Asp Tyr Asn 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445	1343
ggc cgc cgc cgc tac ctg cca gac cta gag gcc cag gtg aag aat gtg Gly Arg Arg Arg Tyr Leu Pro Asp Leu Glu Ala Gln Val Lys Asn Val 450 455 460	1391
cgg gag gcg gcc gag cgc agg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu 480 485 490 495	1487

gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc 1535
 Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val
 500 505 510

ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag 1583
 Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys
 515 520 525

gag gtc atg gag ggg gtg tat ccc ctg gcc gtg cct ctg gag gtg gag 1631
 Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu
 530 535 540

gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

<210> 24
 <211> 562
 <212> PRT
 <213> Thermus aquaticus

<400> 24

Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys Ala
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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
 115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu

130		135		140
Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu				
145		150		155 160
Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val				
	165		170	175
Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg				
	180		185	190
Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Gln Leu Asn				
	195		200	205
Gln Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro				
	210		215	220
Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala				
225		230		235 240
Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu				
	245		250	255
Gln Tyr Arg Glu Leu Asn Lys Leu Lys Ser Thr Gln Ile Thr Gln Leu				
	260		265	270
Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn				
	275		280	285
Gln Thr Ala Thr Gln Thr Gly Arg Leu Ser Ser Ser Gln Pro Asn Leu				
	290		295	300
Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Thr				
305		310		315 320
Phe Ile Ala Glu Glu Gly Arg Leu Leu Val Ala Leu Asp Tyr Asn Gln				
	325		330	335
Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile				
	340		345	350
Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp				
	355		360	365
Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala				
	370		375	380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430

Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445

Arg Arg Arg Tyr Leu Pro Asp Leu Glu Ala Gln Val Lys Asn Val Arg
 450 455 460

Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
 485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
 500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
 515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
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Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 25
 <211> 1688
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS

<222> (3)..(1688)

<400> 25

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Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys	
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gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc	95
Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly	
20 25 30	
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg	143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	
35 40 45	
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa	191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	
50 55 60	
gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg	239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	
65 70 75	
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac	287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	
80 85 90 95	
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag	335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	
100 105 110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767

Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro 260 265 270	815
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe 275 280 285	863
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290 295 300	911
ctc cag aac atc ccc gtc cgc acc ccg ott ggg cag agg atc cgc cgg Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315	959
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc ccg gtc ttc cag gag ggg ccg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc ccg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg ccg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
aag acc ctg gag gag ggc agg agg ccg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445	1343
ggc cgc cgc cgc tac gtg cca gac cta gag gcc ccg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu	1487

480	485	490	495	
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc				1535
Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val				
500		505	510	
ctc gag gcc cca aaa gag agg gcg gag gcc gtg gcc cgg ctg gcc aag				1583
Leu Glu Ala Pro Lys Glu Arg Ala Glu Ala Val Ala Arg Leu Ala Lys				
515		520	525	
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag				1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu				
530		535	540	
gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg				1679
Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu				
545		550	555	
gtg ccg cgc				1688
Val Pro Arg				
560				
<210> 26				
<211> 562				
<212> PRT				
<213> Thermus aquaticus				
<400> 26				
Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys Ala				
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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe				
20		25	30	
Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala				
35		40	45	
Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala				
50		55	60	
Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser				
65		70	75	80
Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro				
85		90	95	
Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly				
100		105	110	
Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg				
115		120	125	

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
 225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
 260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
 290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala

370	375	380
Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg		
385	390	395 400
Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile		
	405	410 415
Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys		
	420	425 430
Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly		
	435	440 445
Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg		
	450	455 460
Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala		
465	470	475 480
Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu		
	485	490 495
Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu		
	500	505 510
Glu Ala Pro Lys Glu Arg Ala Glu Ala Val Ala Arg Leu Ala Lys Glu		
	515	520 525
Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val		
	530	535 540
Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val		
545	550	555 560

Pro Arg

<210> 27
 <211> 1688
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (3) .. (1688)

<400> 27

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Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys	
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gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc	95
Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly	
20 25 30	
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg	143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	
35 40 45	
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa	191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	
50 55 60	
gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg	239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	
65 70 75	
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac	287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	
80 85 90 95	
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag	335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	
100 105 110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gtc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767

Val 240	Val	Leu	Glu	Ala	Leu 245	Arg	Glu	Ala	His	Pro 250	Ile	Val	Glu	Lys	Ile 255	
ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	att	gac	ccc	815
Leu	Gln	Tyr	Arg	Glu 260	Leu	Thr	Lys	Leu	Lys 265	Ser	Thr	Tyr	Ile	Asp	Pro 270	
ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	acc	cgc	ttc	863
Leu	Pro	Asp	Leu 275	Ile	His	Pro	Arg	Thr 280	Gly	Arg	Leu	His 285	Thr	Arg	Phe	
aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	gat	ccc	aac	911
Asn	Gln	Thr 290	Ala	Thr	Ala	Thr	Gly 295	Arg	Leu	Ser	Ser	Ser 300	Asp	Pro	Asn	
ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	atc	cgc	cgg	959
Leu	Gln	Asn 305	Ile	Pro	Val	Arg 310	Thr	Pro	Leu	Gly 315	Gln	Arg	Ile	Arg	Arg	
gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg	gac	tat	agc	1007
Ala	Phe	Ile	Ala	Glu	Glu 325	Gly	Trp	Leu	Leu	Val 330	Ala	Leu	Asp	Tyr	Ser 335	
cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac	gag	aac	ctg	1055
Gln	Ile	Glu	Leu 340	Arg	Val	Leu	Ala	His	Leu 345	Ser	Gly	Asp	Glu	Asn 350	Leu	
atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag	acc	gcc	agc	1103
Ile	Arg	Val 355	Phe	Gln	Glu	Gly	Arg	Asp 360	Ile	His	Thr	Glu	Thr 365	Ala	Ser	
tgg	atg	ttc	ggc	gtc	ccc	cgg	gag	gcc	gtg	gac	ccc	ctg	atg	cgc	cgg	1151
Trp	Met	Phe 370	Gly	Val	Pro	Arg	Glu 375	Ala	Val	Asp	Pro	Leu 380	Met	Arg	Arg	
gcg	gcc	aag	agc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg	tcg	gcc	cac	1199
Ala	Ala	Lys 385	Ser	Ile	Asn	Phe 390	Gly	Val	Leu	Tyr	Gly 395	Met	Ser	Ala	His	
cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc	cag	gcc	ttc	1247
Arg	Leu	Ser	Gln	Glu	Leu 405	Ala	Ile	Pro	Tyr	Glu 410	Glu	Ala	Gln	Ala 415	Phe	
att	gag	cgc	tac	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc	tgg	att	gag	1295
Ile	Glu	Arg	Tyr 420	Phe	Gln	Ser	Phe	Pro	Lys 425	Val	Arg	Ala	Trp	Ile 430	Glu	
aag	acc	ctg	gag	gag	ggc	agg	agg	cgg	ggg	tac	gtg	gag	acc	ctc	ttc	1343
Lys	Thr	Leu 435	Glu	Glu	Gly	Arg	Arg	Arg 440	Gly	Tyr	Val	Glu	Thr 445	Leu	Phe	
ggc	cgc	cgc	cgc	tac	gtg	cca	gac	cta	gag	gcc	cgg	gtg	aag	agc	gtg	1391
Gly	Arg	Arg 450	Arg	Tyr	Val	Pro	Asp 455	Leu	Glu	Ala	Arg	Val 460	Lys	Ser	Val	
cgg	gag	gcg	gcc	gag	cgc	atg	gcc	ttc	aac	atg	ccc	gtc	cag	ggc	acc	1439
Arg	Glu	Ala	Ala	Glu	Arg	Met 470	Ala	Phe	Asn	Met	Pro 475	Val	Gln	Gly	Thr	
gcc	gcc	gac	ctc	atg	aag	ctg	gct	atg	gtg	aag	ctc	tcc	ccc	agg	ctg	1487
Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	Ser	Pro	Arg	Leu	

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Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val							
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ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag							1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys							
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gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag							1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu							
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gtg ggg ata ggg gag gac cgg ctc tcc gcc aag gag gcg gcc gca ctg							1679
Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu							
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Val Pro Arg							
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							15
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							30
Val	Leu	Ser	Arg	Lys	Glu	Pro	Met
			35				40
							45
Ala	Ala	Arg	Gly	Gly	Arg	Val	His
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							60
Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg
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							75
Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu
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							95
Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp
			100				105
							110
Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu
			115				120
							125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Val
 225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
 260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
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Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala

370 375 380
 Ala Lys Ser Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400
 Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415
 Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430
 Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445
 Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
 450 455 460
 Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480
 Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Ser Pro Arg Leu Glu
 485 490 495
 Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
 500 505 510
 Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
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 Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
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Pro Arg

<210> 29
 <211> 1688
 <212> DNA
 <213> *Thermus aquaticus*

<220>
 <221> CDS
 <222> (3)..(1688)

<400> 29

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Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly	
20 25 30	
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg	143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	
35 40 45	
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa	191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	
50 55 60	
gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg	239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	
65 70 75	
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac	287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	
80 85 90 95	
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag	335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	
100 105 110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767

Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro 260 265 270	815
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aac cag acg gtc acg gcc acg ggc agg cta agt agc tcc gat ccc aac Asn Gln Thr Val Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290 295 300	911
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315	959
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
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tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
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ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc atg gcc tac aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu	1487

480	485	490	495	
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc				1535
Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val				
	500	505	510	
ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag				1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys				
	515	520	525	
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag				1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu				
	530	535	540	
gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg				1679
Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu				
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gtg ccg cgc				1688
Val Pro Arg				
560				
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Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala				
	35	40	45	
Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala				
	50	55	60	
Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser				
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Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro				
	85	90	95	
Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly				
	100	105	110	
Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg				
	115	120	125	

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Val Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala

370 375 380
 Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400
 Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415
 Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430
 Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445
 Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
 450 455 460
 Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480
 Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
 485 490 495
 Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
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 Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
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Pro Arg

<210> 31
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 <212> DNA
 <213> *Thermus aquaticus*

<220>
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 <222> (3)..(1688)

<400> 31

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Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly	
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ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg	143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	
35 40 45	
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa	191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	
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gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg	239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	
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agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac	287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	
80 85 90 95	
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag	335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	
100 105 110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767

Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240 245 250 255	
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aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290 295 300	911
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315	959
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc ccg gtc ttc cag gag ggg ccg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc ccg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg ccg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
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ggc cgc cgc cgc tac gtg cca gac cta gag gcc ccg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
ccg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
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Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val							
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ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag							1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys							
	515			520		525	
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag							1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu							
	530			535		540	
gtg ggg ata ggg gag gac cgg ctc tcc gcc aag gag gcg gcc gca ctg							1679
Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu							
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gtg ccg cgc							1688
Val Pro Arg							
560							
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Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala							
	35			40		45	
Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala							
	50			55		60	
Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser							
65	70			75		80	
Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro							
	85			90		95	
Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly							
	100			105		110	
Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg							
	115			120		125	

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
 225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
 260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
 290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala

370 375 380
 Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400
 Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415
 Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430
 Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445
 Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
 450 455 460
 Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480
 Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
 485 490 495
 Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
 500 505 510
 Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
 515 520 525
 Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
 530 535 540
 Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 33
 <211> 1688
 <212> DNA
 <213> *Thermus aquaticus*

<220>
 <221> CDS
 <222> (3)..(1688)

<400> 33

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Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys	
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Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly	
20 25 30	
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg	143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	
35 40 45	
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa	191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	
50 55 60	
gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg	239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	
65 70 75	
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac	287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	
80 85 90 95	
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag	335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	
100 105 110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767

Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro 260 265 270	815
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe 275 280 285	863
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290 295 300	911
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315	959
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc ccg gtc ttc cag gag ggg ccg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc ccg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt ctg agc ttc ccc aag gtg ccg gcc tgg att gag Ile Glu Arg Tyr Phe Leu Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
aag acc ctg gag gag ggc agg agg ccg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445	1343
ggc cgc cgc cgc tac gtg cca gac cta gag gcc ccg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc aag gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu	1487

480	485	490	495	
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc				1535
Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val				
	500	505	510	
ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag				1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys				
	515	520	525	
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ctc ctg gag gtg gag				1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Leu Leu Glu Val Glu				
	530	535	540	
gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg				1679
Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu				
	545	550	555	
gtg ccg cgc				1688
Val Pro Arg				
560				
<210> 34				
<211> 562				
<212> PRT				
<213> Thermus aquaticus				
<400> 34				
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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe				
	20	25	30	
Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala				
	35	40	45	
Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala				
	50	55	60	
Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser				
65		70	75	80
Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro				
	85	90	95	
Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly				
	100	105	110	
Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg				
	115	120	125	

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
 225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
 260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
 290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
 370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415

Glu Arg Tyr Phe Leu Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430

Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
 450 455 460

Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
 485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
 500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
 515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Leu Leu Glu Val Glu Val
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Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
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Pro Arg

<210> 35
 <211> 1688
 <212> DNA
 <213> *Thermus aquaticus*

<220>
 <221> CDS
 <222> (3)..(1688)

<400> 35
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Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys
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Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly
20 25 30

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg 143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
35 40 45

gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa 191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
50 55 60

gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg 239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
65 70 75

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac 287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
80 85 90 95

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
100 105 110

ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag 383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu
115 120 125

cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt 431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu
130 135 140

gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc 479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro
145 150 155

ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac 527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp
160 165 170 175

gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc 575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala
180 185 190

cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc 623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu
195 200 205

aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt 671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu
210 215 220

ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc 719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala
225 230 235

gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767
Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile	
240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc	815
Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro	
260 265 270	
ttg cag gac ctc atc cac ccc agt acg ggc cgc ctc cac acc cgc ttc	863
Leu Gln Asp Leu Ile His Pro Ser Thr Gly Arg Leu His Thr Arg Phe	
275 280 285	
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac	911
Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn	
290 295 300	
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg	959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg	
305 310 315	
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc	1007
Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser	
320 325 330 335	
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg	1055
Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu	
340 345 350	
atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc	1103
Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser	
355 360 365	
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg	1151
Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg	
370 375 380	
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Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His	
385 390 395	
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc	1247
Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe	
400 405 410 415	
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag	1295
Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu	
420 425 430	
aag acc cta gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc	1343
Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe	
435 440 445	
ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gag	1391
Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Glu	
450 455 460	
cgg gag gcg gcc gag cgc atg gcc tac aac atg ccc gtc cag ggc acc	1439
Arg Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr	
465 470 475	
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg	1487

Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu	
480 485 490 495	
gag gaa atg ggg gcc cgg atg ctc ctt cag gtc cac gac gag ctg gtc	1535
Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val	
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ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag	1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys	
515 520 525	
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gcg gag	1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Ala Glu	
530 535 540	
gtg ggg ata ggg gag gat tgg ctc tcc gcc aag gag gcg gcc gca ctg	1679
Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu	
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gtg ccg cgc	1688
Val Pro Arg	
560	
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<400> 36	
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35 40 45	
Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala	
50 55 60	
Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser	
65 70 75 80	
Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro	
85 90 95	
Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly	
100 105 110	
Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg	
115 120 125	

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
 225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
 260 265 270

Gln Asp Leu Ile His Pro Ser Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
 290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380
Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400
Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415
Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430
Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445
Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Glu Arg
450 455 460
Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480
Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495
Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510
Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525
Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Ala Glu Val
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Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
545 550 555 560

Pro Arg

<210> 37
<211> 1688
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (3)..(1688)

<400> 37

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Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys	
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Ala Leu Glu Glu Ala Pro Trp Pro Pro Glu Gly Ala Phe Val Gly	
20 25 30	
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg	143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	
35 40 45	
gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa	191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	
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gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg	239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	
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Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	
80 85 90 95	
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag	335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	
100 105 110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	

gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767
Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile	
240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc	815
Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro	
260 265 270	
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc	863
Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe	
275 280 285	
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac	911
Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn	
290 295 300	
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg	959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg	
305 310 315	
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc	1007
Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser	
320 325 330 335	
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg	1055
Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu	
340 345 350	
atc ccg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc	1103
Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser	
355 360 365	
tgg atg ttc ggc gtc ccc ccg gag gcc gtg gac ccc ctg atg cgc cgg	1151
Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg	
370 375 380	
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac	1199
Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His	
385 390 395	
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc	1247
Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe	
400 405 410 415	
att gag cgc tac ttt cag agc ttc ccc aag gtg ccg gcc tgg att gag	1295
Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu	
420 425 430	
aag acc ctg gag gag ggc agg agg ccg ggg tac gtg gag acc ctc ttc	1343
Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe	
435 440 445	
ggc cgc cgc cgc tac gtg cca gac cta gag gcc ccg gtg aag agc gtg	1391
Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val	
450 455 460	
cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc	1439
Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr	
465 470 475	
gcc gcc gac ctc gtg aag ctg gct atg gtg aag ctc ttc ccc agg ctg	1487

Ala Ala Asp Leu Val Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu	
480 485 490 495	
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc	1535
Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val	
500 505 510	
ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag	1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys	
515 520 525	
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag	1631
Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu	
530 535 540	
gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg	1679
Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Leu	
545 550 555	
gtg ccg cgc	1688
Val Pro Arg	
560	
<210> 38	
<211> 562	
<212> PRT	
<213> Thermus aquaticus	
<400> 38	
Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys Ala	
1 5 10 15	
Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe	
20 25 30	
Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala	
35 40 45	
Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala	
50 55 60	
Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser	
65 70 75 80	
Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro	
85 90 95	
Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly	
100 105 110	
Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg	
115 120 125	

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
 145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
 165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
 180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
 195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
 210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
 225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
 245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
 260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
 275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
 290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
 305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
 325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
 340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
 355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
 370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
 385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
 405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
 420 425 430

Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
 435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
 450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
 465 470 475 480

Ala Asp Leu Val Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
 485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
 500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
 515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
 530 535 540

Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 39
 <211> 12
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 39

Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly
1 5 10

<210> 40

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 40

Ala Ala Ala Leu Val Pro Arg Gly Ser Leu Glu His His His His His
1 5 10 15

His

<210> 41

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 41

Met Lys Tyr Leu Leu Pro Thr Ala Ala Ala Gly Leu Leu Leu Leu Ala
1 5 10 15

Ala Gln Pro Ala Met Ala
20

<210> 42

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 42

Met Lys Thr Leu Leu Ala Met Val Leu Val Gly Leu Leu Leu Leu Pro
1 5 10 15

Pro Gly Pro Ser Met Ala
20

<210> 43

<211> 22

<212> PRT

<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide
 <400> 43
 Met Arg Gly Leu Leu Ala Met Leu Val Ala Gly Leu Leu Leu Leu Pro
 1 5 10 15

Ile Ala Pro Ala Met Ala
 20

<210> 44
 <211> 22
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide
 <400> 44
 Met Arg Arg Leu Leu Val Ile Ala Ala Val Gly Leu Leu Leu Leu Leu
 1 5 10 15

Ala Pro Pro Thr Met Ala
 20

<210> 45
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide
 <400> 45
 gcggccgcac tgggtgccgcg cggcagcctc gag 33

<210> 46
 <211> 148
 <212> PRT
 <213> Homo sapiens

<400> 46
 Ala Asp Gln Leu Thr Glu Glu Gln Ile Ala Glu Phe Lys Glu Ala Phe
 1 5 10 15

Ser Leu Phe Asp Lys Asp Gly Asp Gly Thr Ile Thr Thr Lys Glu Leu
 20 25 30

Gly Thr Val Met Arg Ser Leu Gly Gln Asn Pro Thr Glu Ala Glu Leu
 35 40 45

Gln Asp Met Ile Asn Glu Val Asp Ala Asp Gly Asn Gly Thr Ile Asp
 50 55 60

Phe Pro Glu Phe Leu Thr Met Met Ala Arg Lys Met Lys Asp Thr Asp
65 70 75 80

Ser Glu Glu Glu Ile Arg Glu Ala Phe Arg Val Phe Asp Lys Asp Gly
85 90 95

Asn Gly Tyr Ile Ser Ala Ala Glu Leu Arg His Val Met Thr Asn Leu
100 105 110

Gly Glu Lys Leu Thr Asp Glu Glu Val Asp Glu Met Ile Arg Glu Ala
115 120 125

Asp Ile Asp Gly Asp Gly Gln Val Asn Tyr Glu Glu Phe Val Gln Met
130 135 140

Met Thr Ala Lys
145

<210> 47
<211> 114
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 47
Gln Val Gln Leu Gln Gln Ser Gly Pro Glu Asp Val Lys Pro Gly Ala
1 5 10 15

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp Tyr
20 25 30

Tyr Met Asn Trp Val Lys Gln Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Asp Ile Asn Pro Asn Asn Gly Gly Thr Ser Tyr Asn Gln Lys Phe
50 55 60

Lys Gly Arg Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser Ser Val Tyr Tyr Cys
85 90 95

Glu Ser Gln Ser Gly Ala Tyr Trp Gly Gln Gly Thr Thr Val Thr Val
100 105 110

Ser Ala

<210> 48
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 48
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1 5 10 15

Gly Gly Gly Ser
20

<210> 49
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 49
Asp Tyr Lys Asp Ile Leu Met Thr Gln Thr Pro Ser Ser Leu Pro Val
1 5 10 15

Ser Leu Gly Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile
20 25 30

Val His Ser Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro
35 40 45

Gly Gln Ser Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser
50 55 60

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
65 70 75 80

Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys
85 90 95

Phe Gln Gly Ser His Val Pro Phe Thr Phe Gly Ser Gly Thr Lys Leu
100 105 110

Glu Ile Lys Arg

115

<210> 50
<211> 291
<212> PRT
<213> *Thermus thermophilus*

<400> 50
Met Glu Ala Met Leu Pro Leu Phe Glu Pro Lys Gly Arg Val Leu Leu
1 5 10 15

Val Asp Gly His His Leu Ala Tyr Arg Thr Phe Phe Ala Leu Lys Gly
20 25 30

Leu Thr Thr Ser Arg Gly Glu Pro Val Gln Ala Val Tyr Gly Phe Ala
35 40 45

Lys Ser Leu Leu Lys Ala Leu Lys Glu Asp Gly Tyr Lys Ala Val Phe
50 55 60

Val Val Phe Asp Ala Lys Ala Pro Ser Phe Arg His Glu Ala Tyr Glu
65 70 75 80

Ala Tyr Lys Ala Gly Arg Ala Pro Thr Pro Glu Asp Phe Pro Arg Gln
85 90 95

Leu Ala Leu Ile Lys Glu Leu Val Asp Leu Leu Gly Phe Thr Arg Leu
100 105 110

Glu Val Pro Gly Tyr Glu Ala Asp Asp Val Leu Ala Thr Leu Ala Lys
115 120 125

Lys Ala Glu Lys Glu Gly Tyr Glu Val Arg Ile Leu Thr Ala Asp Arg
130 135 140

Asp Leu Tyr Gln Leu Val Ser Asp Arg Val Ala Val Leu His Pro Glu
145 150 155 160

Gly His Leu Ile Thr Pro Glu Trp Leu Trp Glu Lys Tyr Gly Leu Arg
165 170 175

Pro Glu Gln Trp Val Asp Phe Arg Ala Leu Val Gly Asp Pro Ser Asp
180 185 190

Asn Leu Pro Gly Val Lys Gly Ile Gly Glu Lys Thr Ala Leu Lys Leu
195 200 205

Leu Lys Glu Trp Gly Ser Leu Glu Asn Leu Leu Lys Asn Leu Asp Arg
 210 215 220

Val Lys Pro Glu Asn Val Arg Glu Lys Ile Lys Ala His Leu Glu Asp
 225 230 235 240

Leu Arg Leu Ser Leu Glu Leu Ser Arg Val Arg Thr Asp Leu Pro Leu
 245 250 255

Glu Val Asp Leu Ala Gln Gly Arg Glu Pro Asp Arg Glu Gly Leu Arg
 260 265 270

Ala Phe Leu Glu Arg Leu Glu Phe Gly Ser Leu Leu His Glu Phe Gly
 275 280 285

Leu Leu Glu
 290

<210> 51
 <211> 196
 <212> PRT
 <213> Escherichia coli

<400> 51
 Val Ile Ser Tyr Asp Asn Tyr Val Thr Ile Leu Asp Glu Glu Thr Leu
 1 5 10 15

Lys Ala Trp Ile Ala Lys Leu Glu Lys Ala Pro Val Phe Ala Phe Asp
 20 25 30

Thr Glu Thr Asp Ser Leu Asp Asn Ile Ser Ala Asn Leu Val Gly Leu
 35 40 45

Ser Phe Ala Ile Glu Pro Gly Val Ala Ala Tyr Ile Pro Val Ala His
 50 55 60

Asp Tyr Leu Asp Ala Pro Asp Gln Ile Ser Arg Glu Arg Ala Leu Glu
 65 70 75 80

Leu Leu Lys Pro Leu Leu Glu Asp Glu Lys Ala Leu Lys Val Gly Gln
 85 90 95

Asn Leu Lys Tyr Asp Arg Gly Ile Leu Ala Asn Tyr Gly Ile Glu Leu
 100 105 110

Arg Gly Ile Ala Phe Asp Thr Met Leu Glu Ser Tyr Ile Leu Asn Ser
 115 120 125

Val Ala Gly Arg His Asp Met Asp Ser Leu Ala Glu Arg Trp Leu Lys
 130 135 140

His Lys Thr Ile Thr Phe Glu Glu Ile Ala Gly Lys Gly Lys Asn Gln
 145 150 155 160

Leu Thr Phe Asn Gln Ile Ala Leu Glu Glu Ala Gly Arg Tyr Ala Ala
 165 170 175

Glu Asp Ala Asp Val Thr Leu Gln Leu His Leu Lys Met Trp Pro Asp
 180 185 190

Leu Gln Lys His
 195

<210> 52
 <211> 686
 <212> PRT
 <213> Bacillus circulans

<400> 52
 Ala Pro Asp Thr Ser Val Ser Asn Lys Gln Asn Phe Ser Thr Asp Val
 1 5 10 15

Ile Tyr Gln Ile Phe Thr Asp Arg Phe Ser Asp Gly Asn Pro Ala Asn
 20 25 30

Asn Pro Thr Gly Ala Ala Phe Asp Gly Thr Cys Thr Asn Leu Arg Leu
 35 40 45

Tyr Cys Gly Gly Asp Trp Gln Gly Ile Ile Asn Lys Ile Asn Asp Gly
 50 55 60

Tyr Leu Thr Gly Met Gly Val Thr Ala Ile Trp Ile Ser Gln Pro Val
 65 70 75 80

Glu Asn Ile Tyr Ser Ile Ile Asn Tyr Ser Gly Val Asn Asn Thr Ala
 85 90 95

Tyr His Gly Tyr Trp Ala Arg Asp Phe Lys Lys Thr Asn Pro Ala Tyr
 100 105 110

Gly Thr Ile Ala Asp Phe Gln Asn Leu Ile Ala Ala Ala His Ala Lys
 115 120 125

Asn Ile Lys Val Ile Ile Asp Phe Ala Pro Asn His Thr Ser Pro Ala
 130 135 140

Ser Ser Asp Gln Pro Ser Phe Ala Glu Asn Gly Arg Leu Tyr Asp Asn
 145 150 155 160

Gly Thr Leu Leu Gly Gly Tyr Thr Asn Asp Thr Gln Asn Leu Phe His
 165 170 175

His Asn Gly Gly Thr Asp Phe Ser Thr Thr Glu Asn Gly Ile Tyr Lys
 180 185 190

Asn Leu Tyr Asp Leu Ala Asp Leu Asn His Asn Asn Ser Thr Val Asp
 195 200 205

Val Tyr Leu Lys Asp Ala Ile Lys Met Trp Leu Asp Leu Gly Ile Asp
 210 215 220

Gly Ile Arg Met Asp Ala Val Lys His Met Pro Phe Gly Trp Gln Lys
 225 230 235 240

Ser Phe Met Ala Ala Val Asn Asn Tyr Lys Pro Val Phe Thr Phe Gly
 245 250 255

Glu Trp Phe Leu Gly Val Asn Glu Val Ser Pro Glu Asn His Lys Phe
 260 265 270

Ala Asn Glu Ser Gly Met Ser Leu Leu Asp Phe Arg Phe Ala Gln Lys
 275 280 285

Val Arg Gln Val Phe Arg Asp Asn Thr Asp Asn Met Tyr Gly Leu Lys
 290 295 300

Ala Met Leu Glu Gly Ser Ala Ala Asp Tyr Ala Gln Val Asp Asp Gln
 305 310 315 320

Val Thr Phe Ile Asp Asn His Asp Met Glu Arg Phe His Ala Ser Asn
 325 330 335

Ala Asn Arg Arg Lys Leu Glu Gln Ala Leu Ala Phe Thr Leu Thr Ser
 340 345 350

Arg Gly Val Pro Ala Ile Tyr Tyr Gly Thr Glu Gln Tyr Met Ser Gly
 355 360 365

Gly Thr Asp Pro Asp Asn Arg Ala Arg Ile Pro Ser Phe Ser Thr Ser
 370 375 380

Thr Thr Ala Tyr Gln Val Ile Gln Lys Leu Ala Pro Leu Arg Lys Cys
 385 390 395 400

Asn Pro Ala Ile Ala Tyr Gly Ser Thr Gln Glu Arg Trp Ile Asn Asn
 405 410 415

Asp Val Leu Ile Tyr Glu Arg Lys Phe Gly Ser Asn Val Ala Val Val
 420 425 430

Ala Val Asn Arg Asn Leu Asn Ala Pro Ala Ser Ile Ser Gly Leu Val
 435 440 445

Thr Ser Leu Pro Gln Gly Ser Tyr Asn Asp Val Leu Gly Gly Leu Leu
 450 455 460

Asn Gly Asn Thr Leu Ser Val Gly Ser Gly Gly Ala Ala Ser Asn Phe
 465 470 475 480

Thr Leu Ala Ala Gly Gly Thr Ala Val Trp Gln Tyr Thr Ala Ala Thr
 485 490 495

Ala Thr Pro Thr Ile Gly His Val Gly Pro Met Met Ala Lys Pro Gly
 500 505 510

Val Thr Ile Thr Ile Asp Gly Arg Gly Phe Gly Ser Ser Lys Gly Thr
 515 520 525

Val Tyr Phe Gly Thr Thr Ala Val Ser Gly Ala Asp Ile Thr Ser Trp
 530 535 540

Glu Asp Thr Gln Ile Lys Val Lys Ile Pro Ala Val Ala Gly Gly Asn
 545 550 555 560

Tyr Asn Ile Lys Val Ala Asn Ala Ala Gly Thr Ala Ser Asn Val Tyr
 565 570 575

Asp Asn Phe Glu Val Leu Ser Gly Asp Gln Val Ser Val Arg Phe Val
 580 585 590

Val Asn Asn Ala Thr Thr Ala Leu Gly Gln Asn Val Tyr Leu Thr Gly
 595 600 605

Ser Val Ser Glu Leu Gly Asn Trp Asp Pro Ala Lys Ala Ile Gly Pro
 610 615 620

Met Tyr Asn Gln Val Val Tyr Gln Tyr Pro Asn Trp Tyr Tyr Asp Val
 625 630 635 640

Ser Val Pro Ala Gly Lys Thr Ile Glu Phe Lys Phe Leu Lys Lys Gln
 645 650 655

Gly Ser Thr Val Thr Trp Glu Gly Gly Ser Asn His Thr Phe Thr Ala
 660 665 670

Pro Ser Ser Gly Thr Ala Thr Ile Asn Val Asn Trp Gln Pro
 675 680 685

<210> 53

<211> 399

<212> PRT

<213> Bordetella pertussis

<400> 53

Met Gln Gln Ser His Gln Ala Gly Tyr Ala Asn Ala Ala Asp Arg Glu
 1 5 10 15

Ser Gly Ile Pro Ala Ala Val Leu Asp Gly Ile Lys Ala Val Ala Lys
 20 25 30

Glu Lys Asn Ala Thr Leu Met Phe Arg Leu Val Asn Pro His Ser Thr
 35 40 45

Ser Leu Ile Ala Glu Gly Val Ala Thr Lys Gly Leu Gly Val His Ala
 50 55 60

Lys Ser Ser Asp Trp Gly Leu Gln Ala Gly Tyr Ile Pro Val Asn Pro
 65 70 75 80

Asn Leu Ser Lys Leu Phe Gly Arg Ala Pro Glu Val Ile Ala Arg Ala
 85 90 95

Asp Asn Asp Val Asn Ser Ser Leu Ala His Gly His Thr Ala Val Asp
 100 105 110

Leu Thr Leu Ser Lys Glu Arg Leu Asp Tyr Leu Arg Gln Ala Gly Leu
 115 120 125

Val Thr Gly Met Ala Asp Gly Val Val Ala Ser Asn His Ala Gly Tyr
 130 135 140

Glu Gln Phe Glu Phe Arg Val Lys Glu Thr Ser Asp Gly Arg Tyr Ala
 145 150 155 160

Val Gln Tyr Arg Arg Lys Gly Gly Asp Asp Phe Glu Ala Val Lys Val
 165 170 175

Ile Gly Asn Ala Ala Gly Ile Pro Leu Thr Ala Asp Ile Asp Met Phe
 180 185 190

Ala Ile Met Pro His Leu Ser Asn Phe Arg Asp Ser Ala Arg Ser Ser
 195 200 205

Val Thr Ser Gly Asp Ser Val Thr Asp Tyr Leu Ala Arg Thr Arg Arg
 210 215 220

Ala Ala Ser Glu Ala Thr Gly Gly Leu Asp Arg Glu Arg Ile Asp Leu
 225 230 235 240

Leu Trp Lys Ile Ala Arg Ala Gly Ala Arg Ser Ala Val Gly Thr Glu
 245 250 255

Ala Arg Arg Gln Phe Arg Tyr Asp Gly Asp Met Asn Ile Gly Val Ile
 260 265 270

Thr Asp Phe Glu Leu Glu Val Arg Asn Ala Leu Asn Arg Arg Ala His
 275 280 285

Ala Val Gly Ala Gln Asp Val Val Gln His Gly Thr Glu Gln Asn Asn
 290 295 300

Pro Phe Pro Glu Ala Asp Glu Lys Ile Phe Val Val Ser Ala Thr Gly
 305 310 315 320

Glu Ser Gln Met Leu Thr Arg Gly Gln Leu Lys Glu Tyr Ile Gly Gln
 325 330 335

Gln Arg Gly Glu Gly Tyr Val Phe Tyr Glu Asn Arg Ala Tyr Gly Val
 340 345 350

Ala Gly Lys Ser Leu Phe Asp Asp Gly Leu Gly Ala Ala Pro Gly Val
 355 360 365

Pro Ser Gly Arg Ser Lys Phe Ser Pro Asp Val Leu Glu Thr Val Pro
 370 375 380

Ala Ser Pro Gly Leu Arg Arg Pro Ser Leu Gly Ala Val Glu Arg
 385 390 395

<210> 54
 <211> 275
 <212> PRT
 <213> Bacillus amyloliquefaciens

<400> 54
 Ala Gln Ser Val Pro Tyr Gly Val Ser Gln Ile Lys Ala Pro Ala Leu
 1 5 10 15
 His Ser Gln Gly Tyr Thr Gly Ser Asn Val Lys Val Ala Val Ile Asp
 20 25 30
 Ser Gly Ile Asp Ser Ser His Pro Asp Leu Lys Val Ala Gly Gly Ala
 35 40 45
 Ser Met Val Pro Ser Glu Thr Asn Pro Phe Gln Asp Asn Asn Ser His
 50 55 60
 Gly Thr His Val Ala Gly Thr Val Ala Ala Leu Asn Asn Ser Ile Gly
 65 70 75 80
 Val Leu Gly Val Ala Pro Ser Ala Ser Leu Tyr Ala Val Lys Val Leu
 85 90 95
 Gly Ala Asp Gly Ser Gly Gln Tyr Ser Trp Ile Ile Asn Gly Ile Glu
 100 105 110
 Trp Ala Ile Ala Asn Asn Met Asp Val Ile Asn Met Ser Leu Gly Gly
 115 120 125
 Pro Ser Gly Ser Ala Ala Leu Lys Ala Ala Val Asp Lys Ala Val Ala
 130 135 140
 Ser Gly Val Val Val Val Ala Ala Ala Gly Asn Glu Gly Thr Ser Gly
 145 150 155 160
 Ser Ser Ser Thr Val Gly Tyr Pro Gly Lys Tyr Pro Ser Val Ile Ala
 165 170 175
 Val Gly Ala Val Asp Ser Ser Asn Gln Arg Ala Ser Phe Ser Ser Val
 180 185 190
 Gly Pro Glu Leu Asp Val Met Ala Pro Gly Val Ser Ile Gln Ser Thr
 195 200 205
 Leu Pro Gly Asn Lys Tyr Gly Ala Tyr Asn Gly Thr Ser Met Ala Ser
 210 215 220

Pro His Val Ala Gly Ala Ala Ala Leu Ile Leu Ser Lys His Pro Asn
 225 230 235 240

Trp Thr Asn Thr Gln Val Arg Ser Ser Leu Glu Asn Thr Thr Thr Lys
 245 250 255

Leu Gly Asp Ser Phe Tyr Tyr Gly Lys Gly Leu Ile Asn Val Gln Ala
 260 265 270

Ala Ala Gln
 275

<210> 55
 <211> 182
 <212> PRT
 <213> Bacillus subtilis

<400> 55
 Ala Ala Glu His Asn Pro Val Val Met Val His Gly Ile Gly Gly Ala
 1 5 10 15

Ser Phe Asn Phe Ala Gly Ile Lys Ser Tyr Leu Val Ser Gln Gly Trp
 20 25 30

Ser Arg Asp Lys Leu Tyr Ala Val Asp Phe Trp Asp Lys Thr Gly Thr
 35 40 45

Asn Tyr Asn Asn Gly Pro Val Leu Ser Arg Phe Val Gln Lys Val Leu
 50 55 60

Asp Glu Thr Gly Ala Lys Lys Val Asp Ile Val Ala His Ser Met Gly
 65 70 75 80

Gly Ala Asn Thr Leu Tyr Tyr Ile Lys Asn Leu Asp Gly Gly Asn Lys
 85 90 95

Val Ala Asn Val Val Thr Leu Gly Gly Ala Asn Arg Leu Thr Thr Gly
 100 105 110

Lys Ala Leu Pro Gly Thr Asp Pro Asn Gln Lys Ile Leu Tyr Thr Ser
 115 120 125

Ile Tyr Ser Ser Ala Asp Met Ile Val Met Asn Tyr Leu Ser Arg Leu
 130 135 140

Asp Gly Ala Arg Asn Val Gln Ile His Gly Val Gly His Ile Gly Leu
 145 150 155 160

Leu Tyr Ser Ser Gln Val Asn Ser Leu Ile Lys Glu Gly Leu Asn Gly
165 170 175

Gly Gly Gln Asn Thr Asn
180

<210> 56
<211> 444
<212> DNA
<213> Homo sapiens

<400> 56
gctgaccaac tgactgaaga gcagattgca gaattcaaag aagctttttc actatttgac 60
aaagatgggtg atggaactat aacaacaaag gaattgggaa ctgtaatgag atctcttggg 120
cagaatccca cagaagcaga gttacaggac atgattaatg aagtagatgc tgatggtaat 180
ggcacaattg acttcctga atttctgaca atgatggcaa gaaaaatgaa agacacagac 240
agtgaagaag aaattagaga agcattccgt gtgtttgata aggatggcaa tggctatatt 300
agtgctgcag aacttcgcca tgtgatgaca aaccttggag agaagttaac agatgaagaa 360
gttgatgaaa tgatcagga agcagatatt gatggtgatg gtcaagtaaa ctatgaagag 420
tttgtacaaa tgatgacagc aaag 444

<210> 57
<211> 2058
<212> DNA
<213> Bacillus circulans

<400> 57
gcgccggata cctcggatc caacaagcaa aatttcagca ccgacgtcat ctatcaaatt 60
ttcaccgaca ggttttcggg cggcaatccc gccacaatc cgaccggcgc ggcgtttgac 120
ggaacctgca cgaacctccg gctgtattgc ggcggcgact ggcagggcat catcaacaaa 180
atcaacgacg gttacctgac cgggatgggc gttaccgcca tctggatctc ccagccggtc 240
gaaaacatct acagcatcat caattattcc ggcgtaaaca acacggccta tcacggctac 300
tgggcccggg acttcaagaa gaogaatccg gcctacggca cgattgcgga cttccagaac 360
ctgatcgccg ccgcgcatgc aaaaaacatc aaagtcatta tcgactttgc cccgaaccat 420
acgtcgcccc cctcgtccga ccagccttcc tttgcggaaa acggccgggt gtacgataac 480
ggcacgctgc tcgggggata cacgaacgat acgcagaacc tgttccacca taacggcggc 540
acggactttt ccacgaccga aaacggcatc tacaaaaacc tgtacgatct cgccgacctg 600
aaccataaca acagcaccgt ggacgtctac ttgaaggacg cgatcaaaat gtggctggac 660

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tacggcctga aggcgatgct ggagggctcc gcagccgatt acgcccaggt ggatgaccag	960
gtgacgttca tcgacaacca tgacatggag cgtttccacg caagcaatgc aaaccgccgg	1020
aagctggagc aagcgcttgc gttcacgctg acctcgcgcg gcgtccccgc catttattac	1080
ggcaccgagc agtacatgtc gggcgggacc gatccggaca accgggcgcg gatcccttcc	1140
ttctccacgt cgacgaccgc ctatcaggtc attcaaaagc tggcgccgct gcgcaagtgc	1200
aaccgggcca tcgcctacgg atcgacgcag gagcgctgga tcaacaacga cgtgctcatt	1260
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gtattgtccg gagaccaggt cagcgctccg ttcgttgtca acaacgcgac gacggccctt	1800
gggcaaaatg tgtacctgac gggcagtgct agcgagctgg ggaactggga cccggcaaaa	1860
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agcgttccgg ccggcaaaac gatcgagttc aagtttttga aaaaacaagg ctccaccgtc	1980
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aacgtgaatt ggcagcca	2058

<210> 58
 <211> 1197
 <212> DNA
 <213> Bordetella pertussis

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cgcttggtca acccccatte caccagcctg attgccgaag gggcggccac caaaggattg	180

ggcgtgcacg ccaagtcgtc cgattggggg ttgcaggcgg gctacattcc cgtcaacccg	240
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gactatctgc ggcaagcggg cctggtcacc ggcattggccg atggcgtggg cgcgagcaac	420
cacgcaggct acgagcagtt cgagtttcgc gtgaaggaaa cctcggacgg gcgctatgcc	480
gtgcagtatc gccgcaaggg cggcgacgat ttcgaggcgg tcaaggatgat cggcaatgcc	540
gccggtattc cactgacggc ggatatcgac atgttcgcca ttatgccga tctgtccaac	600
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cgcacgcggc gggccgccag cgaggccacg ggcggcctgg atcgcgaaac catcgacttg	720
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aatgcgctga acaggcgggc gcacgccgtc ggcgcgcagg acgtgggtcca gcatggcact	900
gagcagaaca atcctttccc ggaggcagat gagaagattt tcgtcgtatc ggccaccggt	960
gaaagccaga tgctcacgcg cgggcaactg aaggaataca ttggccagca gcgcggcgag	1020
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gggctgggag ccgcgcccgg cgtgccgagc ggacgttcga agttctcgcc ggatgtactg	1140
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<210> 59

<211> 825

<212> DNA

<213> *Bacillus amyloliquefaciens*

<400> 59

gcgcagtccg tgccttacgg cgtatcacia attaaagccc ctgctctgca ctctcaaggc	60
tacactggat caaatgttaa agtagcgggt atcgacagcg gtatcgattc ttctcatcct	120
gatttaaagg tagcaggcgg agccagcatg gttccttctg aaacaaatcc tttccaagac	180
aacaactctc acggaactca cgttgccggc acagttgcgg ctcttaataa ctcaatcggg	240
gtattaggcg ttgcgccaag cgcatacatt tacgctgtaa aagttctcgg tgctgacggg	300
tccggccaat acagctggat cattaacgga atcgagtggg cgatcgcaaa caatatggac	360
gttattaaca tgagcctcgg cggacattct gggtctgctg ctttaaaagc ggcagttgat	420
aaagccgttg catccggcgt cgtagtcgtt ggcgcagccg gtaacgaagg cacttcggcg	480
agctcaagca cagtgggcta ccctggtaaa tacccttctg tcattgcagt aggcgctggt	540
gacagcagca accaaagagc atctttctca agcgtaggac ctgagcttga tgtcatggca	600

cctggcggtat ctatccaaag cacgcttcct ggaaacaaat acggggcgta caacgggtacg	660
tcaatggcat ctccgcacgt tgccggagcg gctgctttga ttctttctaa gcacccgaac	720
tggaacaaaca ctcaagtccg cagcagttta gaaaacacca ctacaaaact tgggtgattct	780
ttctactatg gaaaagggct gatcaacgta caggcggcag ctacag	825

<210> 60
 <211> 873
 <212> DNA
 <213> *Thermus thermophilus*

<400> 60	
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gtgcaggcgg tctacggctt cgccaagagc ctctcaagg ccctgaagga ggacgggtac	180
aaggccgtct tcgtggtctt tgacgccaag gccccctcct tccgccacga ggcctacgag	240
gcctacaagg cggggagggc cccgaccccc gaggaacttc cccggcagct cgccctcatc	300
aaggagctgg tggacctcct ggggtttacc cgcctcgagg tccccggcta cgaggcggac	360
gacgttctcg ccacctggc caagaaggcg gaaaaggagg ggtacgaggt gcgcatactc	420
accgccgacc gcgacctcta ccaactcgtc tccgaccgcg tcgccgtcct ccaccccgag	480
ggccacctca tcaccccgga gtggcttttg gagaagtacg gcctcaggcc ggagcagtgg	540
gtggacttcc gcgccctcgt gggggacccc tccgacaacc tccccggggt caagggcatc	600
ggggagaaga ccgccctcaa gctcctcaag gagtggggaa gcctggaaaa cctcctcaag	660
aacctggacc gggtaaagcc agaaaacgtc cgggagaaga tcaaggccca cctggaagac	720
ctcaggctct ccttgagct ctcccggtg cgcaccgacc tccccctgga ggtggacctc	780
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ggcagcctcc tccacgagtt cggcctcctg gag	873

<210> 61
 <211> 588
 <212> DNA
 <213> *Escherichia coli*

<400> 61	
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atctctgcta acctggctcg gctttctttt gctatcgagc caggcgtagc ggcatatatt	180
ccggttgctc atgattatct tgatgcgccc gatcaaactc ctccgagcg tgcactcgag	240
ttgctaaaac cgctgctgga agatgaaaag gcgctgaagg tcgggcaaaa cctgaaatac	300

gatcgcggta ttctggcgaa ctacggcatt gaactgcgtg ggattgcgtt tgataccatg	360
ctggagtcct acattctcaa tagcgttgcc gggcgtcacg atatggacag cctcgcggaa	420
cggttggttga agcacaaaac catcactttt gaagagattg ctggtaaagg caaaaatcaa	480
ctgaccttta accagattgc cctcgaagaa gccggacgtt acgccgccga agatgcagat	540
gtcaccttgc agttgcatct gaaaatgtgg ccggatctgc aaaaacac	588

<210> 62
 <211> 1637
 <212> DNA
 <213> *Thermus aquaticus*

<220>
 <221> CDS
 <222> (1)..(1635)

<400> 62 agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala 1 5 10 15	48
ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu 20 25 30	96
ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu 35 40 45	144
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala 50 55 60	192
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro 65 70 75 80	240
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr 85 90 95	288
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu 100 105 110	336
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp 115 120 125	384
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val 130 135 140	432
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val 145 150 155 160	480

cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag	528
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu	
				165					170						175	
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro	
			180					185					190			
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu	
		195					200					205				
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser	
	210					215					220					
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg	720
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val	
225				230					235						240	
ggg	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768
Gly	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr	
				245					250					255		
att	gac	ccc	ttg	cgg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His	
			260					265					270			
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	864
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser	
		275					280					285				
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg	
	290					295					300					
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg	960
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu	
305					310				315						320	
gat	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac	1008
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp	
				325					330					335		
gag	aac	ctg	ata	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag	1056
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu	
			340					345					350			
acc	gcc	agc	tgg	atg	ttc	ggc	gtc	ccc	cgg	gag	gcc	gtg	gac	ccc	ctg	1104
Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu	
		355				360						365				
atg	cgc	cgg	gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg	1152
Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met	
		370				375					380					
tcg	gcc	cac	cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc	1200
Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala	
385					390				395						400	

cag gcc ttc ata gag cgc tgc ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415	1248
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430	1296
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445	1344
aag agc gtg cgg gag gcg gca gag cgc atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460	1392
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465 470 475 480	1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495	1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg 500 505 510	1536
ctg gtc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Val Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515 520 525	1584
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala 530 535 540	1632
gcc gc Ala 545	1637

<210> 63
 <211> 545
 <212> PRT
 <213> Thermus aquaticus

<400> 63
 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Gly Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
 290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
 355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Val Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
545

<210> 64
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (1)..(1635)

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agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc      48
Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1          5          10          15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt      96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
          20          25          30

ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag      144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
          35          40          45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc      192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
          50          55          60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc      240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65          70          75          80

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc      288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
          85          90          95

acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag      336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
          100          105          110

gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg      384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
          115          120          125

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg      432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
          130          135          140

gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg      480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145          150          155          160

cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag      528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
          165          170          175

gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cgc ccc      576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly Arg Pro
          180          185          190

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ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu 195 200 205	624
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser 210 215 220	672
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225 230 235 240	720
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245 250 255	768
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His 260 265 270	816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285	864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300	912
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gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335	1008
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acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365	1104
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tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400	1200
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tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430	1296

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aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460	1392
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Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala 50 55 60	
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro 65 70 75 80	
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr 85 90 95	

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
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Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
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Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
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Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly Arg Pro
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Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
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Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
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Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
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Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
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Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
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Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
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Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
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Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
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Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
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Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
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Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
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Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
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Ala
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<220>

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<400> 66

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ttc	gtg	ggc	ttt	gtg	ctt	tcc	cgc	aag	gag	ccc	atg	tgg	gcc	gat	ctt	96
Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu	
			20					25					30			
ctg	gcc	ctg	gcc	gcc	gcc	agg	ggg	ggc	cgg	gtc	cac	cgg	gcc	ccc	gag	144
Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu	
		35					40					45				
cct	tat	aaa	gcc	ctc	agg	gac	ctg	aag	gag	gcg	cgg	ggg	ctt	ctc	gcc	192
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala	
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Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro	
65					70				75					80		
ggc	gac	gac	ccc	atg	ctc	ctc	gcc	tac	ctc	ctg	gac	cct	tcc	aac	acc	288
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr	
				85					90					95		
acc	ccc	gag	ggg	gtg	gcc	cgg	cgc	tac	ggc	ggg	gag	tgg	acg	gag	gag	336
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu	
			100					105					110			
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg	384
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp	
		115					120					125				
ggg	agg	ctt	gag	ggg	gag	gag	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg	432
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val	
	130					135					140					
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Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu	
			165					170						175		
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro	
			180				185						190			
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu	
		195					200					205				
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser	
	210					215					220					

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tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430	1296
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445	1344
aag agc gtg cgg gag gcg gcc gag cgc aag gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val 450 455 460	1392

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ccc agg ctg gag gaa atg gag gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Glu Ala Arg Met Leu Leu Gln Val His Asp 485 490 495	1488
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ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515 520 525	1584
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala 530 535 540	1632
gcc gc Ala 545	1637
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Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu 35 40 45	
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala 50 55 60	
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro 65 70 75 80	
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr 85 90 95	
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu 100 105 110	
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp 115 120 125	

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
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Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
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Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
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Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
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Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Ile Arg Thr Pro Leu Gly Gln Arg
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Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
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Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Phe His Thr Glu
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Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
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Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
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Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
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Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
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Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
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Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
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Lys Ser Val Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val
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Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Glu Ala Arg Met Leu Leu Gln Val His Asp
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Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
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ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag				144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	35	40	45	
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc				192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	50	55	60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc				240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	65	70	75	80
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc				288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	85	90	95	
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag				336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	100	105	110	
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg				384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	115	120	125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg				432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	130	135	140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg				480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	145	150	155	160
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag				528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	165	170	175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc				576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	180	185	190	
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag				624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag tcc ggc aag cgc tcc				672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Ser Gly Lys Arg Ser	210	215	220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg				720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val	225	230	235	240
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac				768
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr	245	250	255	

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atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380	1152
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400	1200
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415	1248
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aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460	1392
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ccc agg ctg gag gaa atg ggg gcc agg aag ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Lys Leu Leu Gln Val His Asp 485 490 495	1488

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ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg 1584
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 Ala
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Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
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Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
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Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
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Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
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Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
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Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
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Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Ser Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp His Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
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Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
 355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Lys Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 70
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 70
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Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu

35	40	45	
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala 50 55 60			192
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro 65 70 75 80			240
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr 85 90 95			288
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu 100 105 110			336
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp 115 120 125			384
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val 130 135 140			432
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val 145 150 155 160			480
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu 165 170 175			528
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro 180 185 190			576
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu 195 200 205			624
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser 210 215 220			672
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225 230 235 240			720
gag aag atc ctg cgg tac cgg gag ctc acc aag ctg aag agc acc tac Glu Lys Ile Leu Arg Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245 250 255			768
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His 260 265 270			816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285			864

gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300	912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu 305 310 315 320	960
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335	1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340 345 350	1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365	1104
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380	1152
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400	1200
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415	1248
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430	1296
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445	1344
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460	1392
cag ggc acc gcc gcc gac ctc atg aag ctg act atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Thr Met Val Lys Leu Phe 465 470 475 480	1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495	1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg 500 505 510	1536
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515 520 525	1584

gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg 1632
 Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

gcc gc 1637
 Ala
 545

<210> 71
 <211> 545
 <212> PRT
 <213> *Thermus aquaticus*

<400> 71
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Arg Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Thr Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 72
 <211> 1637
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (1)..(1635)

<400> 72
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 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
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ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
 Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
 Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
 Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro

65	70	75	80	
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc				288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	85	90	95	
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag				336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	100	105	110	
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg				384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	115	120	125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg				432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	130	135	140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg				480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	145	150	155	160
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag				528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	165	170	175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc				576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	180	185	190	
ctc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag				624
Leu Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc				672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser	210	215	220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg				720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val	225	230	235	240
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac				768
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr	245	250	255	
att gac ccc ttg cca gac ctc atc cac ccc agg acg ggc cgc ctc cac				816
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His	260	265	270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc				864
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser	275	280	285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg				912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg	290	295	300	
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg				960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu	305	310	315	320

gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335	1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340 345 350	1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365	1104
atg cgc cgg gcg gcc aag gcc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Ala Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380	1152
tca gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400	1200
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415	1248
tgg att gag aag acc ctg gag gag ggc agg aga cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430	1296
acc ctc ttc ggc cgc cgc cgc tat gtg cct gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445	1344
aag agc gtg cgg gag gcg gcc gag cgc atg gcc tac aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val 450 455 460	1392
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465 470 475 480	1440
acc agg ctg gag gaa acg ggg gcc agg atg ctc ctt cag gtc cac gac Thr Arg Leu Glu Glu Thr Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495	1488
gag ctg gtc ctc gag gcc cct aaa gag ggg gcg gag gcc gtg gcc cgg Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg 500 505 510	1536
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515 520 525	1584
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala 530 535 540	1632
gcc gc Ala 545	1637

<210> 73
 <211> 545
 <212> PRT
 <213> Thermus aquaticus

<400> 73
 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

 Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

 Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

 Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

 Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

 Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

 Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

 Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

 Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

 Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

 Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

 Leu Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

 Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
 290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
 355 360 365

Met Arg Arg Ala Ala Lys Ala Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Thr Arg Leu Glu Glu Thr Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 74
 <211> 1637
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (1)..(1635)

<400> 74
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 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15
 ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30
 ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
 Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45
 cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
 Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60
 aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
 Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80
 ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc 288
 Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95
 acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag 336
 Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu

100								105				110								
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg	384				
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp					
	115						120					125								
ggg	agg	ctt	gag	ggg	gag	gag	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg	432				
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val					
	130					135					140									
gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg	480				
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val					
145					150					155					160					
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag	528				
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu					
				165					170					175						
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576				
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro					
		180						185					190							
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624				
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu					
		195					200					205								
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672				
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser					
	210					215					220									
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg	720				
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val					
225					230					235					240					
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768				
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr					
				245					250					255						
att	gac	ccc	ttg	cgc	gac	ccc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816				
Ile	Asp	Pro	Leu	Pro	Asp	Pro	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His					
			260					265					270							
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	864				
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser					
		275					280					285								
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912				
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg					
	290					295					300									
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg	960				
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu					
305					310					315					320					
gac	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac	1008				
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp					
				325					330					335						
gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag	1056				
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu					
			340					345					350							

acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365	1104
atg cgc cgg acg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Thr Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380	1152
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400	1200
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415	1248
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430	1296
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445	1344
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460	1392
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465 470 475 480	1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495	1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gtc cgg Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Val Arg 500 505 510	1536
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515 520 525	1584
gag gtg aag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg Glu Val Lys Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala 530 535 540	1632
gcc gc Ala 545	1637

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 <212> PRT
 <213> Thermus aquaticus

<400> 75
 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala

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Leu Ala Leu	Ala Ala Ala Arg Gly Gly Arg Val His Arg	Ala Pro Glu	
35	40	45	
Pro Tyr Lys	Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly	Leu Leu Ala	
50	55	60	
Lys Asp Leu	Ser Val Leu Ala Leu Arg Glu Gly Leu Gly	Leu Pro Pro	
65	70	75	80
Gly Asp Asp	Pro Met Leu Leu Ala Tyr Leu Leu Asp	Pro Ser Asn Thr	
85	90	95	
Thr Pro Glu	Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp	Thr Glu Glu	
100	105	110	
Ala Gly Glu	Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala	Asn Leu Trp	
115	120	125	
Gly Arg Leu	Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr	Arg Glu Val	
130	135	140	
Glu Arg Pro	Leu Ser Ala Val Leu Ala His Met Glu Ala	Thr Gly Val	
145	150	155	160
Arg Leu Asp	Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu	Val Ala Glu	
165	170	175	
Glu Ile Ala	Arg Leu Glu Ala Glu Val Phe Arg Leu Ala	Gly His Pro	
180	185	190	
Phe Asn Leu	Asn Ser Arg Asp Gln Leu Glu Arg Val Leu	Phe Asp Glu	
195	200	205	
Leu Gly Leu	Pro Ala Ile Gly Lys Thr Glu Lys Thr	Gly Lys Arg Ser	
210	215	220	
Thr Ser Ala	Ala Val Leu Glu Ala Leu Arg Glu Ala His	Pro Ile Val	
225	230	235	240
Glu Lys Ile	Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys	Ser Thr Tyr	
245	250	255	

Ile Asp Pro Leu Pro Asp Pro Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
 290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
 355 360 365

Met Arg Arg Thr Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Val Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Lys Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 76
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 76
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Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc 288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag 336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg 384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg 432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val

130	135	140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val 145 150 155 160			480
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu 165 170 175			528
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro 180 185 190			576
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu 195 200 205			624
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser 210 215 220			672
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225 230 235 240			720
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245 250 255			768
att gac ccc ttg ccg gac ctc ttc cac ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp Leu Phe His Pro Arg Thr Gly Arg Leu His 260 265 270			816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285			864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300			912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gtc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Val Leu 305 310 315 320			960
gac tat agt cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335			1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340 345 350			1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365			1104
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380			1152

tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc	1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala	
385 390 395 400	
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc	1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala	
405 410 415	
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag	1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu	
420 425 430	
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg	1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val	
435 440 445	
aag agc gtg cgg gag gcg gcc gag cgc atg gcc tcc aac atg ccc gtc	1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Ser Asn Met Pro Val	
450 455 460	
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc	1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe	
465 470 475 480	
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac	1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp	
485 490 495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg	1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg	
500 505 510	
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg	1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu	
515 520 525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg	1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala	
530 535 540	
gcc gc	1637
Ala	
545	

<210> 77
 <211> 545
 <212> PRT
 <213> Thermus aquaticus

<400> 77
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu

35

40

45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp Leu Phe His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
 290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Val Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
 355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Ser Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 78
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (1) .. (1635)

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Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15
ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30
ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc 288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag 336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg 384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg 432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg 480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag 528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu

165										170					175					
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576				
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro					
180					185					190										
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624				
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu					
195					200					205										
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672				
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser					
210					215					220										
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg	720				
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val					
225					230					235					240					
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768				
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr					
245					250					255										
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816				
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His					
260					265					270										
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	864				
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser					
275					280					285										
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912				
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg					
290					295					300										
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg	960				
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu					
305					310					315					320					
gac	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac	1008				
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp					
325					330					335										
gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag	1056				
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu					
340					345					350										
acc	gcc	agc	tgg	atg	ttc	ggc	gtc	ccc	cga	gag	gcc	gtg	gac	ccc	ctg	1104				
Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu					
355					360					365										
atg	cgc	cgg	gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg	1152				
Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met					
370					375					380										
tcg	gcc	cac	cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc	1200				
Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala					
385					390					395					400					
cag	gcc	ttc	att	gag	cgc	tac	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc	1248				
Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala					
405					410					415										

tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag	1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu	
420 425 430	
acc ctc ttc ggt cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg	1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val	
435 440 445	
aag agc gtg cgg aag gcg gcc gag cgc aag gcc ttc aac atg ccc gtc	1392
Lys Ser Val Arg Lys Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val	
450 455 460	
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc	1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe	
465 470 475 480	
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac	1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp	
485 490 495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg	1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg	
500 505 510	
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg	1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu	
515 520 525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg	1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala	
530 535 540	
gcc gc	1637
Ala	
545	

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 <212> PRT
 <213> Thermus aquaticus

<400> 79
 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro

65					70					75					80
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr
				85					90					95	
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu
			100					105					110		
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp
		115					120					125			
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val
	130					135					140				
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val
145					150					155					160
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu
				165					170					175	
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro
			180					185					190		
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu
		195					200					205			
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser
	210					215						220			
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val
225					230					235					240
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr
				245					250					255	
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His
			260					265					270		
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser
		275					280					285			
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg
	290					295					300				
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu
305					310					315					320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
 355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Lys Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 80
 <211> 1637
 <212> DNA
 <213> *Thermus aquaticus*

<220>
 <221> CDS
 <222> (1) .. (1635)

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Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
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ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt      96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
          20          25          30

ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag      144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
          35          40          45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc      192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
          50          55          60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc      240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65          70          75          80

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc      288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
          85          90          95

acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag      336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
          100          105          110

gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg      384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
          115          120          125

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg      432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
          130          135          140

gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg      480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
          145          150          155          160

cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag      528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
          165          170          175

gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc      576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
          180          185          190

ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag      624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu

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acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225 230 235 240			720
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245 250 255			768
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His 260 265 270			816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285			864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300			912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu 305 310 315 320			960
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335			1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340 345 350			1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365			1104
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380			1152
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400			1200
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415			1248
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430			1296
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445			1344

aag agc gtg cgg gag gcg gcc gag cgc agg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val 450 455 460	1392
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465 470 475 480	1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495	1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg 500 505 510	1536
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515 520 525	1584
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala 530 535 540	1632
gcc gc Ala 545	1637

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 <213> Thermus aquaticus

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Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu

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Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp
		115					120					125			
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val
		130					135					140			
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val
							150					155			160
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu
				165					170					175	
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro
			180					185					190		
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu
			195				200					205			
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser
			210				215					220			
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val
							230					235			240
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr
				245					250					255	
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His
			260					265					270		
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser
			275					280				285			
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg
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Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu
							310					315			320
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp
				325					330					335	
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Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
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 Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380
 Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400
 Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415
 Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430
 Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445
 Lys Ser Val Arg Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val
 450 455 460
 Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480
 Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495
 Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510
 Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525
 Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

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 <213> Thermus aquaticus

<220>
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<222> (1)..(1635)

<400> 82

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ttc	gtg	ggc	ttt	gtg	ctt	tcc	cgc	aag	gag	ccc	atg	tgg	gcc	gat	ctt	96
Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu	
			20					25					30			
ctg	gcc	ctg	gcc	gcc	gcc	agg	ggg	ggc	cgg	gtc	cac	cgg	gcc	ccc	gag	144
Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu	
		35					40					45				
cct	tat	aaa	gcc	ctc	agg	gac	ctg	aag	gag	gcg	cgg	ggg	ctt	ctc	gcc	192
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala	
	50					55					60					
aaa	gac	ctg	agc	gtt	ctg	gcc	ctg	agg	gaa	ggc	ctt	ggc	ctc	ccg	ccc	240
Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro	
65					70					75					80	
ggc	gac	gac	ccc	atg	ctc	ctc	gcc	tac	ctc	ctg	gac	cct	tcc	aac	acc	288
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr	
				85					90					95		
acc	ccc	gag	ggg	gtg	gcc	cgg	cgc	tac	ggc	ggg	gag	tgg	acg	gag	gag	336
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu	
			100					105					110			
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg	384
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp	
		115					120					125				
ggg	agg	ctt	gag	ggg	gag	gag	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg	432
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val	
	130					135					140					
gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg	480
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val	
145					150					155					160	
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag	528
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu	
			165						170					175		
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro	
		180						185					190			
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu	
		195					200					205				
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser	
	210					215					220					
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg	720
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val	

225	230	235	240	
gag aag atc ctg	cag tac cgg gag ctc	acc aag ctg aag agc acc tac		768
Glu Lys Ile Leu	Gln Tyr Arg Glu Leu	Thr Lys Leu Lys Ser Thr Tyr		
	245	250	255	
att gac ccc ttg	cgg gac ctc atc cac ccc	agg acg ggc cgc ctc cac		816
Ile Asp Pro Leu	Pro Asp Leu Ile His Pro	Arg Thr Gly Arg Leu His		
	260	265	270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc				864
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser				
	275	280	285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg				912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg				
	290	295	300	
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gtc ctg				960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Val Leu				
	305	310	315	320
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac				1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp				
	325	330	335	
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag				1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu				
	340	345	350	
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg				1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu				
	355	360	365	
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg				1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met				
	370	375	380	
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc				1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala				
	385	390	395	400
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc				1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala				
	405	410	415	
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag				1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu				
	420	425	430	
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg				1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val				
	435	440	445	
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc				1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val				
	450	455	460	
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc				1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe				
	465	470	475	480

ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac 1488
 Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg 1536
 Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg 1584
 Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg 1632
 Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

gcc gc 1637
 Ala
 545

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 <213> Thermus aquaticus

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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
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Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val

130	135	140
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val		
145	150	155 160
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu		
	165	170 175
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro		
	180	185 190
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu		
	195	200 205
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser		
	210	215 220
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val		
	225	230 235 240
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr		
	245	250 255
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His		
	260	265 270
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser		
	275	280 285
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg		
	290	295 300
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Val Leu		
	305	310 315 320
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp		
	325	330 335
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu		
	340	345 350
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu		
	355	360 365
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met		
	370	375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

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 <212> DNA
 <213> Thermus aquaticus

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 <222> (1)..(1635)

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 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
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ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96

Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu		
			20					25					30				
ctg	gcc	ctg	gcc	gcc	gcc	agg	ggg	ggc	cgg	gtc	cac	cgg	gcc	ccc	gag	144	
Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu		
		35					40					45					
cct	tat	aaa	gcc	ctc	agg	gac	ctg	aag	gag	gcg	cgg	ggg	ctt	ctc	gcc	192	
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala		
	50					55					60						
aaa	gac	ctg	agc	gtt	ctg	gcc	ctg	agg	gaa	ggc	ctt	ggc	ctc	ccg	ccc	240	
Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro		
65					70					75					80		
ggc	gac	gac	ccc	atg	ctc	ctc	gcc	tac	ctc	ctg	gac	cct	tcc	aac	acc	288	
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr		
				85					90					95			
acc	ccc	gag	ggg	gtg	gcc	cgg	cgc	tac	ggc	ggg	gag	tgg	acg	gag	gag	336	
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu		
			100					105					110				
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg	384	
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp		
			115				120					125					
ggg	agg	ctt	gag	ggg	gag	gag	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg	432	
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val		
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Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val		
	145				150					155					160		
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag	528	
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu		
				165					170					175			
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576	
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro		
			180					185					190				
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624	
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu		
		195					200					205					
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672	
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser		
	210					215					220						
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Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val		
	225				230					235					240		
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768	
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr		
				245					250					255			
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816	
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His		

260										265					270					
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	864				
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser					
275						280			285											
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912				
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg					
290						295			300											
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg	960				
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu					
305			310			315			320											
gac	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac	1008				
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp					
			325			330			335											
gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag	1056				
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu					
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Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Gln	Glu	Ala	Val	Asp	Pro	Leu					
355						360			365											
atg	cgc	cgg	gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg	1152				
Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met					
370						375			380											
tcg	gcc	cac	cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc	1200				
Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala					
385			390			395			400											
cag	gcc	ttc	att	gag	cgc	tac	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc	1248				
Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala					
			405			410			415											
tgg	att	gag	aag	acc	ctg	gag	gag	ggc	agg	agg	cgg	ggg	tac	gtg	gag	1296				
Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Gly	Tyr	Val	Glu					
420						425			430											
acc	ctc	ttc	ggc	cgc	cgc	cgc	tac	gtg	cca	gac	cta	gag	gcc	cgg	gtg	1344				
Thr	Leu	Phe	Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val					
435						440			445											
aag	agc	gtg	cgg	gag	gcg	gcc	gag	cgc	atg	gcc	ttc	aac	atg	ccc	gtc	1392				
Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro	Val					
450						455			460											
cag	ggc	acc	gcc	gcc	gac	ctc	atg	aag	ctg	gct	atg	gtg	aag	ctc	ttc	1440				
Gln	Gly	Thr	Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	Phe					
465			470			475			480											
ccc	agg	ctg	gag	gaa	atg	ggg	gcc	agg	atg	ctc	ctt	cag	gtc	cac	gac	1488				
Pro	Arg	Leu	Glu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His	Asp					
			485			490			495											
gag	ctg	gtc	ctc	gag	gcc	cca	aaa	gag	ggg	gcg	gag	gcc	gtg	gcc	cgg	1536				
Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg					
500						505			510											

ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg 1584
 Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg 1632
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 530 535 540

gcc gc 1637
 Ala
 545

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 <212> PRT
 <213> Thermus aquaticus

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 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu

	165		170		175
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	180		185		190
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	195		200		205
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser	210		215		220
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val	225		230		235
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr		245		250	255
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His		260		265	270
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser		275		280	285
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg		290		295	300
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu	305		310		315
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp		325		330	335
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu		340		345	350
Thr Ala Ser Trp Met Phe Gly Val Pro Gln Glu Ala Val Asp Pro Leu		355		360	365
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met		370		375	380
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala	385		390		395
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala		405		410	415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
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Ala
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
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ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192

Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala		
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Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro	80	
65					70				75								
ggc	gac	gac	ccc	atg	ctc	ctc	gcc	tac	ctc	ctg	gac	cct	tcc	aac	acc	288	
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr	95	
				85					90								
acc	ccc	gag	ggg	gtg	gcc	cgg	cgc	tac	ggc	ggg	gag	tgg	acg	gag	gag	336	
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu	110	
			100					105									
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg	384	
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp	125	
			115				120					125					
ggg	agg	ctt	gag	ggg	gag	gag	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg	432	
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val	140	
	130					135											
gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg	480	
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val	160	
					150					155							
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag	528	
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu	175	
				165					170								
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576	
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro	190	
			180					185					190				
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624	
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu	205	
			195				200										
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672	
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser	220	
	210					215											
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Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val	240	
					230					235							
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768	
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr	255	
				245					250								
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816	
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His	270	
			260					265									
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Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser	285	
			275				280										
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912	
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		

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gac tat agc cag ata Asp Tyr Ser Gln Ile 325	gag ctc agg gtg ctg Glu Leu Arg Val 330	gcc cac ctc tcc ggc gac Ala His Leu Ser Gly Asp 335	1008
gag aac ctg atc cgg gtc ttc Glu Asn Leu Ile Arg Val 340	cag gag ggg cgg gac Gln Glu Gly Arg Asp 345	atc cac acg gag Ile His Thr Glu 350	1056
acc gcc agc tgg atg ttc Thr Ala Ser Trp Met 355	ggc gtc ccc cgg gag Gly Val Pro Arg 360	gcc gtg gac ccc ctg Ala Val Asp Pro 365	1104
atg cgc cgg gcg gcc aag Met Arg Arg Ala Ala Lys 370	acc atc aac ttc ggg gtc Thr Ile Asn Phe Gly 375	ctc tac ggc atg Leu Tyr Gly Met 380	1152
tcg gcc cac cgc ctc tcc Ser Ala His Arg Leu 385	cag gag cta gcc atc cct Gln Glu Leu Ala Ile 390	tac gag gag gcc Tyr Glu Glu Ala 395	1200
cag gcc ttc att gag cgc Gln Ala Phe Ile Glu 405	tac ttt cag agc ttc ccc Tyr Phe Gln Ser Phe 410	aag gtg cgg gcc Lys Val Arg Ala 415	1248
tgg att gag aag acc ctg Trp Ile Glu Lys Thr 420	gag gag ggc agg agg Glu Glu Gly Arg Arg 425	cgg ggg tac gtg gag Arg Gly Tyr Val Glu 430	1296
acc ctc ttc ggc cgc cgc Thr Leu Phe Gly Arg 435	cgc cgc tac gtg cca gac Arg Arg Tyr Val Pro 440	cta gag gcc cgg gtg Leu Glu Ala Arg Val 445	1344
aag agc gtg cgg gag gcg Lys Ser Val Arg Glu 450	gcc gag cgc aag gcc ttc Ala Glu Arg Lys Ala 455	aac atg ccc gtc Asn Met Pro Val 460	1392
cag ggc acc gcc gcc gac Gln Gly Thr Ala Ala 465	ctc atg aag ctg gct atg Leu Met Lys Leu Ala 470	gtg aag ctc ttc Val Lys Leu Phe 475	1440
ccc agg ctg gag gaa atg Pro Arg Leu Glu Glu 485	ggg gcc agg atg ctc ctt Gly Ala Arg Met Leu 490	cag gtc cac gac Gln Val His Asp 495	1488
gag ctg gtc ctc gag gcc Glu Leu Val Leu Glu 500	cca aaa gag ggg gcg Pro Lys Glu Gly Ala 505	gag gcc gtg gcc cgg Glu Ala Val Ala Arg 510	1536
ctg gcc aag gag gtc atg Leu Ala Lys Glu Val 515	gag ggg gtg tat ccc Glu Gly Val Tyr Pro 520	ctg gcc gtg ccc ctg Leu Ala Val Pro Leu 525	1584
gag gtg gag gtg ggg ata Glu Val Glu Val Gly 530	ggg gag gac tgg ctc tcc Glu Glu Asp Trp Leu 535	gcc aag gag gcg Ala Lys Glu Ala 540	1632

gcc gc
Ala
545

1637

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<213> *Thermus aquaticus*

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Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu

195	200	205
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser		
210	215	220
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val		
225	230	235
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr		
	245	250
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His		
	260	265
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser		
	275	280
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg		
	290	300
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu		
305	310	315
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp		
	325	330
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu		
	340	345
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu		
	355	360
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met		
	370	375
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala		
385	390	395
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala		
	405	410
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu		
	420	425
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val		
	435	440
		445

Lys Ser Val Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
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Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
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Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
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Ala
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	
ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag	144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288

Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr		
				85					90					95			
acc	ccc	gag	ggg	gtg	gcc	cgg	cgc	tac	ggc	ggg	gag	tgg	acg	gag	gag	336	
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu		
			100					105					110				
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg	384	
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp		
			115				120					125					
ggg	agg	ctt	gag	ggg	gag	gag	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg	432	
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val		
	130					135					140						
gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg	480	
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val		
					150					155					160		
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag	528	
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu		
				165					170					175			
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576	
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro		
			180					185					190				
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624	
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu		
			195				200					205					
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672	
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser		
			210			215					220						
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg	720	
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val		
					230					235					240		
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768	
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr		
				245					250					255			
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816	
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His		
			260					265					270				
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	864	
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser		
			275				280					285					
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912	
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		
			290			295					300						
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg	960	
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu		
					310				315						320		
gac	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac	1008	
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp		

325								330				335				
gag aac ctg atc cgg gtc ttc cag	gag ggg cgg gac atc cac acg gag	1056														
Glu Asn Leu Ile Arg Val Phe Gln	Glu Gly Arg Asp Ile His Thr Glu															
340	345 350															
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg	1104															
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu																
355	360 365															
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg	1152															
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met																
370	375 380															
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc	1200															
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala																
385	390 395 400															
cag gcc ttc att gag cgc aac ttt cag agc ttc ccc aag gtg cgg gcc	1248															
Gln Ala Phe Ile Glu Arg Asn Phe Gln Ser Phe Pro Lys Val Arg Ala																
405	410 415															
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag	1296															
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu																
420	425 430															
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg	1344															
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val																
435	440 445															
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc	1392															
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val																
450	455 460															
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc	1440															
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe																
465	470 475 480															
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac	1488															
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp																
485	490 495															
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg	1536															
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg																
500	505 510															
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg	1584															
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu																
515	520 525															
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg	1632															
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala																
530	535 540															
gcc gc	1637															
Ala																
545																

<210> 89
<211> 545

<212> PRT

<213> *Thermus aquaticus*

<400> 89

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val

225		230		235		240
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr						
		245		250		255
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His						
		260		265		270
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser						
		275		280		285
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg						
		290		295		300
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu						
305		310		315		320
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp						
		325		330		335
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu						
		340		345		350
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu						
		355		360		365
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met						
		370		375		380
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala						
385		390		395		400
Gln Ala Phe Ile Glu Arg Asn Phe Gln Ser Phe Pro Lys Val Arg Ala						
		405		410		415
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu						
		420		425		430
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val						
		435		440		445
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val						
		450		455		460
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe						
465		470		475		480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

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<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30
ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc 288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag 336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg 384

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg	432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag	528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	
165 170 175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc	576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	
180 185 190	
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag	624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	
195 200 205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc	672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser	
210 215 220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg	720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val	
225 230 235 240	
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac	768
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr	
245 250 255	
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac	816
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His	
260 265 270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc	864
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser	
275 280 285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg	912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg	
290 295 300	
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg	960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu	
305 310 315 320	
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac	1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp	
325 330 335	
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag	1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu	
340 345 350	
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg	1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu	

355	360	365	
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tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400			1200
cag gcc ttc att gag cgc tgc ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415			1248
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430			1296
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445			1344
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460			1392
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465 470 475 480			1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495			1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg 500 505 510			1536
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515 520 525			1584
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala 530 535 540			1632
gcc gc Ala 545			1637
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<213> Thermus aquaticus			
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 Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45
 Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60
 Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80
 Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95
 Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110
 Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125
 Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140
 Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160
 Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175
 Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190
 Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205
 Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220
 Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240
 Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255
 Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His

260	265	270
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285		
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300		
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu 305 310 315 320		
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335		
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340 345 350		
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365		
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380		
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400		
Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415		
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430		
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445		
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460		
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465 470 475 480		
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495		
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg 500 505 510		

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

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<211> 1637
<212> DNA
<213> *Thermus aquaticus*

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<222> (1)..(1635)

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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30
ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc 288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag 336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg 384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg 432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg 480

Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val		
145					150					155					160		
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag		528
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu		
				165					170					175			
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc		576
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro		
			180					185					190				
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag		624
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu		
		195					200					205					
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc		672
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser		
	210					215					220						
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg		720
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val		
225					230					235				240			
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac		768
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr		
				245					250					255			
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac		816
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His		
			260					265					270				
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc		864
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser		
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gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg		912
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		
	290					295					300						
atc	cgc	cgg	gcc	ttc	aac	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg		960
Ile	Arg	Arg	Ala	Phe	Asn	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu		
305					310				315					320			
gac	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac		1008
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp		
				325					330					335			
gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	agg	gac	atc	cac	acg	gag		1056
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu		
			340					345					350				
acc	gcc	agc	tgg	atg	ttc	ggc	gtc	ccc	cgg	gag	gcc	gtg	gac	ccc	ctg		1104
Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu		
		355					360					365					
atg	cgc	cgg	gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg		1152
Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met		
	370					375					380						
tcg	gcc	cac	cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc		1200
Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala		

385	390	395	400	
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc				1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala	405	410	415	
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag				1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu	420	425	430	
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg				1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val	435	440	445	
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc				1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val	450	455	460	
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc				1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe	465	470	475	480
ccc agg ctg gag gaa atg ggg gcc agg atg ccc ctt cag gtc cac gac				1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Pro Leu Gln Val His Asp	485	490	495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg				1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg	500	505	510	
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg				1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu	515	520	525	
gag gtg aag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg				1632
Glu Val Lys Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala	530	535	540	
gcc gc				1637
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545				
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu				
20	25	30		
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu				
35	40	45		

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
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Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
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Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg

290		295		300
Ile Arg Arg Ala Phe Asn Ala Glu Glu Gly Trp Leu Leu Val Ala Leu				
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Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp				
	325		330	335
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu				
	340		345	350
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu				
	355		360	365
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met				
	370		375	380
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala				
385		390		395 400
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala				
	405		410	415
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu				
	420		425	430
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val				
	435		440	445
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val				
	450		455	460
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe				
465		470		475 480
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Pro Leu Gln Val His Asp				
	485		490	495
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg				
	500		505	510
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu				
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Glu Val Lys Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala				
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Ala
545

<210> 94
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (1)..(1635)

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ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt      96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
          20          25          30

ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag      144
Leu Ala Leu Ala Ala Ala Arg Gly Arg Val His Arg Ala Pro Glu
          35          40          45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc      192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
          50          55          60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc      240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65          70          75          80

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc      288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
          85          90          95

acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag      336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
          100          105          110

gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg      384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
          115          120          125

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg      432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
          130          135          140

gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg      480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145          150          155          160

cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag      528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
          165          170          175

gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc      576

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Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro		
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Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu		
		195					200					205					
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672	
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser		
	210					215					220						
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Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val		
225					230					235				240			
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768	
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr		
				245					250					255			
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816	
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His		
			260					265					270				
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	864	
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser		
		275					280					285					
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912	
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		
	290					295					300						
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Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu		
305					310				315					320			
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gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag	1056	
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Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala		
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cag	gcc	ttc	att	gag	cgc	tgc	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc	1248	
Gln	Ala	Phe	Ile	Glu	Arg	Cys	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala		
			405					410						415			
tgg	att	gag	aag	acc	ctg	gag	gag	ggc	agg	agg	cgg	ggg	tac	gtg	gag	1296	
Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Gly	Tyr	Val	Glu		

	420	425	430	
acc ctc ttc ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg				1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val				
	435	440	445	
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc				1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val				
	450	455	460	
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg gag ctc ttc				1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Glu Leu Phe				
	465	470	475	480
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac				1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp				
	485	490	495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg				1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg				
	500	505	510	
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg				1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu				
	515	520	525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg				1632
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gcc gc				1637
Ala				
545				
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Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala				
50 55 60				
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro				
65 70 75 80				

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
 290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp

	325		330		335
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu	340		345		350
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu	355		360		365
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met	370		375		380
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala	385		390		395
Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala	405		410		415
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu	420		425		430
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val	435		440		445
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val	450		455		460
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Glu Leu Phe	465		470		475
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp	485		490		495
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg	500		505		510
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu	515		520		525
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala	530		535		540
Ala					
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<210> 96
 <211> 1637

<212> DNA
 <213> *Thermus aquaticus*

<220>
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 <222> (1)..(1635)

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1          5          10          15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt      96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
          20          25          30

ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag     144
Leu Ala Leu Ala Ala Ala Arg Gly Arg Val His Arg Ala Pro Glu
          35          40          45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc     192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
          50          55          60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc     240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65          70          75          80

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc     288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
          85          90          95

acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag     336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
          100          105          110

gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg     384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
          115          120          125

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg     432
Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
          130          135          140

gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg     480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145          150          155          160

cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag     528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
          165          170          175

gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc     576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
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ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gaa     624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
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cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc     672

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gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac		768
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr		
				245					250					255			
att	gac	ccc	ttg	cgg	ggc	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac		816
Ile	Asp	Pro	Leu	Pro	Gly	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His		
			260					265					270				
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc		864
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser		
		275					280					285					
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg		912
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		
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atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg		960
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu		
305					310					315					320		
gac	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac		1008
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp		
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gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag		1056
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu		
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acc	gcc	agc	tgg	atg	ttc	ggc	gtc	ccc	cgg	gag	gcc	gtg	gac	ccc	ctg		1104
Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu		
		355					360					365					
atg	cgc	cgg	gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg		1152
Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met		
		370				375					380						
tcg	gcc	cac	cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc		1200
Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala		
385					390					395					400		
cag	gcc	ttc	att	gag	cgc	tac	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc		1248
Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala		
				405					410					415			
tgg	att	gag	aag	acc	ctg	gag	gag	ggc	agg	agg	cgg	ggg	tac	gtg	gag		1296
Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Gly	Tyr	Val	Glu		
			420					425					430				
acc	ctc	ttc	ggc	cgc	cgc	cgc	tac	gtg	cca	gac	cta	gag	gcc	cgg	gtg		1344
Thr	Leu	Phe	Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val		
		435					440					445					
aag	agc	gtg	cgg	gag	gcg	gcc	gag	cgc	atg	gcc	ttc	aac	atg	ccc	gtc		1392
Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro	Val		

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cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc			1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe			
465	470	475	480
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag atc cac gac			1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Ile His Asp			
	485	490	495
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg			1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg			
	500	505	510
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg			1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu			
	515	520	525
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg			1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala			
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gcc gc			1637
Ala			
545			
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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu			
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Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu			
	35	40	45
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala			
	50	55	60
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro			
	65	70	75
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr			
	85	90	95
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu			
	100	105	110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Gly Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
 290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu

355 360 365
 Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

 Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

 Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
 405 410 415

 Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

 Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

 Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
 450 455 460

 Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

 Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Ile His Asp
 485 490 495

 Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
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 Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
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 Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
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Ala
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<220>
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<400> 98

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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	
ctg gcc ctg gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag	144
Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
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Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	
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Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag	528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	
165 170 175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc	576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	
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ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag	624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	
195 200 205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc	672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser	
210 215 220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg	720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val	
225 230 235 240	
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac	768

Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr		
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Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His		
			260				265						270				
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc		864
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser		
		275					280					285					
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg		912
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		
	290					295					300						
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg		960
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu		
305					310				315						320		
gac	tat	aac	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac		1008
Asp	Tyr	Asn	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp		
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gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag		1056
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu		
			340					345					350				
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Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu		
		355					360					365					
atg	cgc	cgg	gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg		1152
Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met		
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tcg	gcc	cac	cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc		1200
Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala		
385					390					395					400		
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Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala		
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Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Gly	Tyr	Val	Glu		
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acc	ctc	ttc	ggc	cgc	cgc	cgc	tac	gtg	cca	gac	cta	gag	gcc	cgg	gtg		1344
Thr	Leu	Phe	Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val		
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aag	agc	gtg	cgg	gag	gcg	gcc	gag	cgc	atg	gcc	ttc	aac	atg	ccc	gtc		1392
Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro	Val		
	450					455					460						
cag	ggc	acc	gcc	gcc	gac	ctc	atg	aag	ctg	gct	atg	gtg	aag	ctc	ttc		1440
Gln	Gly	Thr	Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	Phe		
465					470				475						480		
ccc	agg	ctg	gag	gaa	atg	ggg	gcc	agg	atg	ctc	ctt	cag	gtc	cac	gac		1488
Pro	Arg	Leu	Glu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His	Asp		

485										490					495					
gag	ctg	gtc	ctc	gag	gcc	cca	aaa	gag	ggg	gcg	gag	gcc	gtg	gcc	cgg	1536				
Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg					
500				505				510												
ctg	gcc	aag	gag	gtc	atg	gag	ggg	gtg	tat	ccc	ctg	gcc	gtg	tcc	ctg	1584				
Leu	Ala	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Ser	Leu					
515				520				525												
gag	gtg	gag	gtg	ggg	ata	ggg	gag	gac	tgg	ctc	tcc	gcc	aag	gag	gcg	1632				
Glu	Val	Glu	Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	Ala					
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Ala																				
545																				
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<400> 99																				
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Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu					
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Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu					
35				40				45												
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala					
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Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro					
65				70				75				80								
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr					
85				90				95												
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu					
100				105				110												
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp					
115				120				125												
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val					
130				135				140												

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
 195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
 210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
 225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
 245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
 260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
 275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
 290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
 305 310 315 320

Asp Tyr Asn Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
 325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
 355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
 370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala

Lys Ser Leu Leu Lys Ala Leu Lys Glu Asp Gly Asp Ala Val Ile Val
 50 55 60

Val Phe Asp Ala Lys Ala Pro Ser Phe Arg His Glu Ala Tyr Gly Gly
 65 70 75 80

Tyr Lys Ala Gly Arg Ala Pro Thr Pro Glu Asp Phe Pro Arg Gln Leu
 85 90 95

Ala Leu Ile Lys Glu Leu Val Asp Leu Leu Gly Leu Ala Arg Leu Glu
 100 105 110

Val Pro Gly Tyr Glu Ala Asp Asp Val Leu Ala Ser Leu Ala Lys Lys
 115 120 125

Ala Glu Lys Glu Gly Tyr Glu Val Arg Ile Leu Thr Ala Asp Lys Asp
 130 135 140

Leu Tyr Gln Leu Leu Ser Asp Arg Ile His Val Leu His Pro Glu Gly
 145 150 155 160

Tyr Leu Ile Thr Pro Ala Trp Leu Trp Glu Lys Tyr Gly Leu Arg Pro
 165 170 175

Asp Gln Trp Ala Asp Tyr Arg Ala Leu Thr Gly Asp Glu Ser Asp Asn
 180 185 190

Leu Pro Gly Val Lys Gly Ile Gly Glu Lys Thr Ala Arg Lys Leu Leu
 195 200 205

Glu Glu Trp Gly Ser Leu Glu Ala Leu Leu Lys Asn Leu Asp Arg Leu
 210 215 220

Lys Pro Ala Ile Arg Glu Lys Ile Leu Ala His Met Asp Asp Leu Lys
 225 230 235 240

Leu Ser Trp Asp Leu Ala Lys Val Arg Thr Asp Leu Pro Leu Glu Val
 245 250 255

Asp Phe Ala Lys Arg Arg Glu Pro Asp Arg Glu Arg Leu Arg Ala Phe
 260 265 270

Leu Glu Arg Leu Glu Phe Gly Ser Leu Leu His Glu Phe Gly Leu Leu
 275 280 285

Glu Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly

290				295				300							
Ala 305	Phe	Val	Gly	Phe	Val 310	Leu	Ser	Arg	Lys	Glu 315	Pro	Met	Trp	Ala	Asp 320
Leu	Leu	Ala	Leu	Ala 325	Ala	Ala	Arg	Gly	Gly 330	Arg	Val	His	Arg	Ala 335	Pro
Glu	Pro	Tyr	Lys 340	Ala	Leu	Arg	Asp	Leu 345	Lys	Glu	Ala	Arg	Gly 350	Leu	Leu
Ala	Lys	Asp 355	Leu	Ser	Val	Leu	Ala 360	Leu	Arg	Glu	Gly	Leu 365	Gly	Leu	Pro
Pro	Gly 370	Asp	Asp	Pro	Met	Leu 375	Leu	Ala	Tyr	Leu	Leu 380	Asp	Pro	Ser	Asn
Thr 385	Thr	Pro	Glu	Gly	Val 390	Ala	Arg	Arg	Tyr	Gly 395	Gly	Glu	Trp	Thr	Glu 400
Glu	Ala	Gly	Glu	Arg 405	Ala	Ala	Leu	Ser	Glu 410	Arg	Leu	Phe	Ala	Asn 415	Leu
Trp	Gly	Arg	Leu 420	Glu	Gly	Glu	Glu	Arg 425	Leu	Leu	Trp	Leu	Tyr	Arg	Glu
Val	Glu	Arg 435	Pro	Leu	Ser	Ala	Val 440	Leu	Ala	His	Met	Glu 445	Ala	Thr	Gly
Val	Arg 450	Leu	Asp	Val	Ala	Tyr 455	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala
Glu 465	Glu	Ile	Ala	Arg	Leu 470	Glu	Ala	Glu	Val	Phe 475	Arg	Leu	Ala	Gly	His 480
Pro	Phe	Asn	Leu	Asn 485	Ser	Arg	Asp	Gln	Leu 490	Glu	Arg	Val	Leu	Phe	Asp
Glu	Leu	Gly	Leu 500	Pro	Ala	Ile	Gly	Lys 505	Thr	Glu	Lys	Thr	Gly 510	Lys	Arg
Ser	Thr	Ser 515	Ala	Ala	Val	Leu	Glu 520	Ala	Leu	Arg	Glu	Ala 525	His	Pro	Ile
Val	Glu	Lys 530	Ile	Leu	Gln	Tyr 535	Arg	Glu	Leu	Thr	Lys 540	Leu	Lys	Ser	Thr

Tyr Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu
 545 550 555 560

His Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser
 565 570 575

Ser Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln
 580 585 590

Arg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala
 595 600 605

Leu Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly
 610 615 620

Asp Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr
 625 630 635 640

Glu Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro
 645 650 655

Leu Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly
 660 665 670

Met Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu
 675 680 685

Ala Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg
 690 695 700

Ala Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val
 705 710 715 720

Glu Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg
 725 730 735

Val Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro
 740 745 750

Val Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu
 755 760 765

Phe Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His
 770 775 780

Asp Glu Leu Val Leu Glu Ala Pro Lys Glu Arg Ala Glu Ala Val Ala
 785 790 795 800

Arg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro
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<220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

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<210> 102
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<220>
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<400> 102
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<210> 103
 <211> 34
 <212> RNA
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<220>
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<400> 103
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<210> 104
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 <212> RNA
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<220>
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 aagccuacua cuccgaacug accgugcuac caau 34

<210> 105
 <211> 34
 <212> RNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

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 <210> 106
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 <220>
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

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 <210> 107
 <211> 5
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic peptide

 <400> 107
 Ser Gly Gly Gly Gly
 1 5

 <210> 108
 <211> 6
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic peptide

 <400> 108
 His His His His His His
 1 5